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ABSTRACT

A study was conducted to identify a comprehensive set of attributes that differentiate occupations and occupational groups. It also determined the feasibility of linking counselee preferences for those attributes to the World-of-Work Map (WWM), a career exploration tool used in DISCOVER, a computer-based career planning system. A literature review was conducted to identify occupational attributes commonly supported by research and practice. Ratings on 36 attributes for 425 occupations were analyzed to obtain additional research-based information on viable attributes and the feasibility of a WWM linkage. The analyses identified occupational attributes that differentiated specific occupations, occupations grouped by Holland's types, and occupations grouped by job families within Holland's types. Results of the analyses indicated the feasibility of linking occupational attribute preferences to the WWM via job families. It appeared that DISCOVER's procedure for linking attribute preferences to occupations could be similar to the procedure currently used with interests and abilities. On the basis of the literature review and the results of study analyses, 16 occupational attributes were recommended for use by DISCOVER. (Appendixes include a list of 39 references, 12 data tables, 19 figures, sample profiles for 36 occupational attributes, definitions of attributes used in analyses, and definitions of recommended attributes.) (YLB)

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Occupational Attributes Differentiating Holland's Occupational Types, Job Families, and Occupations

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OCCUPATIONAL ATTRIBUTES DIFFERENTIATING HOLLAND'S OCCUPATIONAL TYPES, JOB FAMILIES, AND OCCUPATIONS

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ABSTRACT

The purposes of this study were (a) to identify a comprehensive set of attributes that differentiate occupations and occupational groups and (b) to determine the feasibility of linking counselee preferences for those attributes to the World-of-Work Map (WWM). (The WWM is a career exploration tool used in DISCOVER, ACT's computer-based career planning system). A literature review was conducted to identify occupational attributes commonly supported by research and practice, and ratings on 36 attributes for 425 occupations were analyzed to obtain additional, research-based information relevant to study objectives. The analyses identified occupational attributes that differentiate specific occupations, occupations grouped by Holland's types, and occupations grouped by job families within Holland's types. Results of the analyses indicated the feasibility of linking occupational attribute preferences to the WWM via job families. Thus, it appears that DISCOVER's procedure for linking attribute preferences to occupations can be similar to the procedure currently used with interests and abilities. On the basis of the literature review and the results of study analyses, 16 occupational attributes were recommended for use by DISCOVER.

OCCUPATIONAL ATTRIBUTES DIFFERENTIATING HOLLAND'S OCCUPATIONAL TYPES, JOB FAMILIES, AND OCCUPATIONS

A number of aspects of the world of work are important to workers, employers, counselors, and counselees. One such aspect has been termed work attributes or job attributes--hereafter called occupational attributes. Most occupations have a number of attributes (e.g., opportunity for helping others, for creativity, for autonomy) that make them different from some occupations and similar to other occupations.

People value various occupational attributes to varying degrees, and a person's job satisfaction appears to be related to amount of correspondence between the attributes a person values most and those provided by the occupation (e.g., see Dawis & Lofquist, 1984). The value placed on an occupational attribute has been termed a job value or a work value, but Pryor (1979) suggested that the term work preference replace the previous terms. Pryor also stated that work preferences may reveal the underlying needs of an individual. Zytowski (1987) suggested that the word preferences be substituted for needs, values, and interests because preferences are more observable. The following discussion adopts the suggestions of Pryor and Zytowski, and uses the term attribute preferences in place of both job values and work values.

It is commonly recognized that attribute preferences and vocational interests overlap to some extent; for example, helping others is often identified as both an attribute preference and a vocational interest. However, research results concerning the

relationship between attribute preferences and vocational interests have been inconsistent. Some studies (Knapp & Knapp, 1979; Nordvik, 1991; Toenjes & Borgen, 1974) reported correlations in the .20 to .40 range between corresponding pairs of attribute preferences and vocational interests (e.g., challenge and enterprising interests, security and conventional interests). Other studies reported low to zero relationships (Breme & Cockriel, 1975; Pryor & Taylor, 1986; Rounds, 1990; Taylor & Pryor, 1986). In a study using factor analysis with a large national sample of high school seniors, Chapman, Katz, Norris, and Pears (1977) found that attribute preferences were distinct from interests and aptitudes.

Earlier, Katz (1969) suggested that a conceptual distinction could be made between values (attribute preferences) and interests. He proposed that values apply to feelings about the outcomes of work (e.g., earnings) and that interests apply to activities that allow a worker to achieve the desired outcomes. This view of occupational attributes implies that vocational interests and attribute preferences are distinct. However, such a view eliminates attributes (e.g., creativity, autonomy, helping others) not directly related to outcomes. Zytowski (1970), in an early review of the literature on attribute preferences, suggested that attribute preferences can be grouped into three general categories: extrinsic (an outcome of working; e.g., earnings), intrinsic (part of the work itself; e.g., helping others), and concomitant (accompanying the work; e.g., working outdoors). The study reported here addresses all three categories of attribute preferences.

Although the correlations between attribute preferences and vocational interests are generally low, the descriptions of some attribute preferences are similar to the descriptions of some vocational interests. For example, helping others is both an attribute preference (e.g., altruism or human concern) and a vocational interest (e.g., social service), as noted above. Given the similarities between certain attribute preferences and certain vocational interests, one might ask, "Why measure both?"

First, the similarities are far from identities (e.g., inter-correlations have generally been low). Second, many attributes in attribute preference inventories are not addressed by interest inventories. For example, only 4 of 21 attributes covered by Nevill and Super's (1986) Values Scales are similar to interests. Third, the focus of the measures is different. In an interest inventory, the focus is on whether a person likes or dislikes specific activities. In an attribute preference inventory, the focus is on the relative importance (to the person) of the attribute among other attributes. Usually, the attribute is addressed globally rather than by specific items that provide scaled scores. For these reasons, measures of attribute preferences and vocational interests appear to add substantially different pieces of information to the career planning process.

Purposes of Study

The purposes of this study were (a) to identify a comprehensive set of attributes that differentiate occupations and occupational groups and (b) to determine the feasibility of linking counselee preferences for those attributes to the World-of-Work Map (WWM; Prediger, 1981). If successful, this study will provide the basis for a subsequent study that would obtain and analyze new occupational attribute ratings in order to develop an attribute-

WWM linkage procedure for use in DISCOVER, the computer-based career planning system developed by American College Testing (ACT; 1990). Such a linkage procedure would help DISCOVER users (e.g., high school students) identify WWM job families and specific occupations that have attributes congruent with their occupational preferences.

There were three study phases. First, a literature review was conducted to identify attributes commonly supported by research and practice. Second, attribute data for 425 occupations were analyzed to obtain additional research-based information on viable attributes and the feasibility of a WWM linkage. Third, results from the first two phases were synthesized in order to identify a comprehensive set of occupational attributes for use in DISCOVER. Person-dependent attributes (e.g., interesting work, challenging work) were not considered because, in computer-based career planning systems such as DISCOVER, it must be possible to determine the attributes characterizing occupations without knowledge of a given person's characteristics (e.g., vocational interests, abilities).

Literature Review

Method and Scope

The following terms, singly and in various combinations, were used to search the PsycINFO data base (American Psychological Association, 1990) for the years 1967 to present: job values, work values, work attributes, occupational attributes, and job characteristics. Also, two articles (Pryor, 1979; Zytowski, 1970) were used to search the Social SCISEARCH data base (Institute for Scientific Information, 1991) for the years 1972 to present. Finally, the review included a search, for the years 1972 to present, of

the contents of 15 relevant journals (e.g., the Career Development Quarterly, Journal of Counseling Psychology, Journal of Vocational Behavior).

Fifty-two sources of relevant information were retrieved--i.e., sources that were data-based, that comprehensively reviewed the relevant topics, or that were concerned with the development and/or use of an attribute inventory. The following summary of the most relevant findings is organized around three topics: attribute preferences of persons, attributes of occupations, and attributes commonly supported by research and practice.

Occupational Attribute Preferences

Some of the earliest work on the attribute preferences of persons involved the endorsement or ranking of attribute statements (Rosenberg, 1957; Schaffer, 1953). For example, Schaffer had 72 college students and workers rank 12 needs such as creativity, challenge, and dependence. More recently, Sampson, Stripling, and Pyle (1978) had students rank the 10 attribute preferences contained in the System of Interactive Guidance Information (SIGI; described below). The attributes most and least frequently endorsed were interesting work and early entry, respectively. In general, research has shown that the ranking of attribute preferences has been relatively stable through the years. Attribute preferences such as interesting work, creativity, and variety have been consistently ranked high. If they qualify in other ways, such attributes would be good candidates for use in DISCOVER.

The ten attributes developed by Chapman et al. (1977) for SIGI are high income, prestige, independence, helping others, security, variety, leadership, working in a

particular field of interest (interesting work), leisure, and early entry. These attributes were developed in a series of studies using large samples of high school students who ranked attributes in various ways. The authors used statistical analyses (e.g., the factor analysis cited above) to verify that the ten SIGI attributes differentiated occupations in sensible ways.

In a study of attribute preference dimensions, Pryor (1987) used factor analysis and obtained a three-factor solution for the Work Aspect Preference Scale (WAPS). The WAPS, which consists of 13 scales (see Tables 8 and 9 for scale titles), was administered to samples of tenth, eleventh, and twelfth grade students and to a sample of adults--each sample consisting of more than 1,000 persons. Pryor found that the following factors differentiated persons with respect to attribute preferences: Freedom (e.g., creativity and independence), Non-work Orientation (e.g., detachment and life-style), and People or Human/Personal Concern (e.g., altruism and coworkers). Though these three factors appeared consistently across age groups, they did not account for more than 40 percent of the total inter-person variance. Thus, a substantial amount of attribute preference variance remained.

Other authors have identified more than three attribute preference factors. In a factor analysis of scores on the Minnesota Importance Questionnaire (MIQ, see Tables 8 and 9) for over 3,000 employed workers and 439 students, Lofquist and Dawis (1978) obtained six factors: Safety, Comfort, Aggrandizement, Altruism, Achievement, and Autonomy. The six factors were reduced to the following broad classes of values (second-order factors): External Environment, People, and Self- or Intrinsic

Reinforcement. Bolton (1980), using 45 items from Super's 1973 Work Values Inventory (WVI) with 445 physically disabled persons, also obtained a six-factor solution. The six factors were: Stimulating Work, Interpersonal Satisfaction, Economic Security, Responsible Autonomy, Comfortable Existence, and Aesthetic Concerns.

Nevill and Super (1986) described the development of the Values Scale (VS; see Tables 8 and 9), a 21-scale replacement of the WVI. In a series of factor analyses of VS scores for various samples (e.g., high school students, adult workers, workers in other countries), Nevill and Super consistently obtained six VS factors: Prestige, Risk, Cultural Identity, Creativity, Altruism/Aesthetics, and Social Interaction/Relations. (The VS manual does not report the percent of total variance accounted for by the factors.) Other factors (e.g., Autonomy) were obtained for some samples but not all.

In a comprehensive factor analytic study, Macnab and Fitzsimmons (1987) used four attribute preference instruments (MIQ, WAPS, WVI, and VS) in a multitrait-multimethod analysis of scores for 438 university students. They found support for eight common attribute factors: Authority, Social Relations, Creativity, Autonomy, Economic Security, Altruism, Work Conditions or Setting, and Prestige. These eight factors were common to all four instruments and accounted for 70 percent of variance. The Macnab-Fitzsimmons results indicated that the method used to obtain attribute preferences was of less importance than hypothesized.

Although popular, factor analysis was not used exclusively in research on attribute preferences. For example, Elizur (1984) and Borg (1986), in highly similar studies, used smallest space analysis (a form of multidimensional scaling analysis) and found that

attribute preferences could be plotted on a plane. In the latter study, Borg used a list of 13 occupational attributes (e.g., income, interesting work, responsibility) with 1,500 adults, who rated them on importance. He then analyzed an intercorrelation matrix based on the importance ratings.

Borg divided the planar attribute locations he obtained into the following three regions, which he separated with lines radiating from an arbitrary origin: instrumental-material (e.g., income), affective-social (e.g., altruism), and cognitive-psychological (e.g., interesting work). He further categorized the regions by distance from the origin and proposed four distance categories. Attributes associated with personal gain (e.g., advancement, recognition) were located closest to the origin and those associated with organizational system rewards (e.g., working conditions) were located farthest from the origin. Although only two dimensions were needed to map the 13 occupational attribute preferences, Borg's subdivision of the two-dimensional space suggests that many more than two types of attribute preferences warrant attention.

Occupational Attributes

Although the studies reported in the previous section were based on the attribute preferences of people, those reported below were based on the attributes of occupations (In general, the attributes of occupations have received less attention.) Occupational attributes were assessed either through expert judgment (e.g., job analysis, supervisor ratings) or the attribute preferences of workers in the occupations.

Rounds, Shubsachs, Dawis, and Lofquist (1978) studied occupational reinforcers (attributes) for 181 occupations grouped by Holland's (1985) types. To assess attributes,

the authors used the Minnesota Job Description Questionnaire (MJDQ; 21 attribute scales as in the MIQ) and the Position Analysis Questionnaire (PAQ; 13 attribute dimensions). An analysis of variance (ANOVA) was used to identify differences among the mean attribute scores of occupations grouped by Holland's types. For eight attributes (ability utilization, achievement, autonomy, compensation, creativity, moral values, social status, and social service), the differences were as hypothesized. Overall, 21 statistically significant differences were obtained. The results were interpreted as partially supporting the use of occupational attributes to describe Holland's six types.

In a closely related study, Shubsachs, Rounds, Dawis, and Lofquist (1978) factor analyzed MIQ and MJDQ ratings for 109 occupations. They obtained a three-factor solution for each of the two instruments. The three MJDQ factors--Self-Reinforcement, Environmental/Organizational Reinforcement, and Reinforcement via Altruism--corresponded to the three MIQ factors--Achievement-Autonomy, Safety-Comfort, and Altruism. The total inter-occupation variance accounted for was approximately 50 percent in both analyses. Recall that the Lofquist and Dawis (1978) study using the MIQ for samples of people obtained three second-order factors: Self- or Intrinsic Reinforcement, External Environment, and People. Clearly, the factors obtained in these two studies are similar. (For factor content, readers are referred to the study reports.) Thus, results from the two studies suggest a correspondence between attribute preference dimensions and occupational attribute dimensions.

In a study similar to the Rounds et al. (1978) study, Hyland and Muchinsky (1991) used the 13 overall dimensions of the PAQ (e.g., decision/communication

responsibilities) to obtain mean profiles for 86 occupations grouped by Holland's (1985) types. An ANOVA yielded mean scale score differences among Holland's types for 11 of the 13 dimensions, and a discriminant analysis yielded a 56% correct classification rate for a holdout sample (a rate substantially better than chance). Only two discriminant functions achieved statistical significance ($p < .001$). Together, they accounted for 71% of the among-group variance. The results of this study indicated that Holland's types can be differentiated by occupational attributes.

Recent research conducted by the Department of Defense (Wall & Zytowski, 1991) resulted in a list of 13 work values (see Tables 8 and 9) for use in the Armed Services Vocational Aptitude Battery (ASVAB) Career Exploration Program. This list was established through a cluster analysis of 91 work values (occupational attributes) that had previously been assigned to homogenous groups by a panel of experts working independently. A cluster analysis based on the group assignments identified 15 clusters of attributes that subsequently were reduced, through expert judgment, to a somewhat altered set of 13 attributes.

Attributes Commonly Identified

The number of attribute dimensions identified by research using factor analysis varied from study to study. Perhaps because authors of attribute inventories usually attempt to develop scales with relatively independent scores, factor analyses of such scores generally identify a small numbers of factors and leave a large portion of attribute variance unaccounted for. Consequently, results of the factor analyses do not appear to preclude using a number of attributes to assess preferences and to describe occupations.

Although the literature was inconsistent regarding the number of attributes needed to describe preferences and occupations, two points should be noted. First, research shows that attribute preferences can be used to distinguish people, occupations, or groups of occupations from one another. Second, a number of attributes are commonly reported in the literature: variety, creativity, earnings, achievement, prestige, ability utilization, independence, work setting, altruism, working with others, physical activity, autonomy, and job security. These attributes were all found, with some wording differences, in the ASVAB, MIQ, PAQ, VS, WAPS, and WVI as well as in other instruments.

Comparisons of common attributes are presented in Tables 9 and 10, which are discussed in the Implications section below. However, not all of these attributes can be recommended for inclusion in computer-based career planning systems. Recall that systems such as DISCOVER must use occupational attributes that are person-independent.

ACT Research on Occupational Attributes

As noted in the introduction, a primary purpose of this study was to determine the feasibility of linking occupational attribute preferences to the WWM, the primary career exploration/planning tool used in DISCOVER. Such a linkage could provide WWM locations (and occupational options) based on a counselee attribute preferences--just as DISCOVER currently provides WWM locations based on counselee interests and abilities.

This phase of the study drew on occupational attribute ratings obtained from DISCOVER (ACT, 1990) and the Guide for Occupational Exploration (GOE; Harrington & O'Shea, 1984). Together, these two sources provide ratings on 45 attributes for each of 425 occupations. The following objectives were addressed:

1. To determine whether this comprehensive set of occupational attributes differentiates, in a sensible way, specific occupations and occupational groups--i.e., Holland's (1985) types. If so--

2. To determine whether occupational attributes differentiate job families within Holland's types.

For purposes of analysis, the 425 occupations were classified by ACT Job Cluster, ACT Job Family, and educational level (ACT, 1990). Since ACT Job Clusters parallel Holland's (1985) six types of occupations (Prediger, 1976), Holland's types (or their abbreviations) are used to designate job clusters in the discussion that follows. Job cluster titles, related Holland types, and their abbreviations are: Business Contact--Enterprising (E), Business Operations--Conventional (C), Technical--Realistic (R), Science--Investigative (I), Arts--Artistic (A), and Social Service--Social (S). Table 1 provides the number of occupations per Holland type (job cluster), job family, and education level.

Variables

Appendices B1 and B2 provide definitions for the nine "job values" and the nine "job characteristics" (collectively called DISCOVER attributes) included in the analyses. These DISCOVER components were developed independently, as described below.

DISCOVER job values. The nine occupational attributes in this component of DISCOVER evolved from a comprehensive set of job values identified during the Work Importance Study (Super, 1982). Under the direction of Donald Super, a team of researchers from 10 countries reviewed the international literature on occupational attributes, developed attribute preference scales, and determined the psychometric characteristics of those scales. They concluded that there was sufficient psychometric support to warrant the assessment of preferences for 21 types of occupational attributes. An early version of DISCOVER included 16 of the 21 attributes. (Since DISCOVER requires attribute ratings for occupations, Work Importance Study attributes especially difficult to rate--e.g., associates, life style, spirituality--were excluded.)

DISCOVER's applications of the 16 attributes were reviewed by a panel of seven experienced doctoral level vocational psychologists, including Donald Super. Definitions were clarified through panel discussion, and a 3-point rating scale was formulated for each attribute. The scale, which applied to each of the 16 attributes, addressed the potential for experiencing a given attribute in a given occupation. The rating categories were "little," "moderate or uncertain," and "considerable." After a training session and related discussion, panel members independently rated each of the 425 occupations (all of those included in DISCOVER at that time) on each of the attributes.

Panel ratings provided the basis for a new study of occupational attributes relevant to an occupational search. Whereas the 21 attribute preferences identified in the Work Importance Study were based on analyses of the responses of persons to items in a preference inventory, the new study focused on the attributes of occupations. The

primary purpose of the study was to identify a comprehensive set of relatively independent attributes that differentiate occupations. The study also sought to identify attributes for which reasonably accurate occupational ratings could be obtained. Although the study focused on the attributes of occupations, these attributes had their basis in the Work Importance Study attribute preferences noted above. Thus, they should be relevant to what persons want out of a job.

As reported by Dunbar (1985), INDSCAL multidimensional scaling analyses (MDS) of the attribute ratings provided plots showing attribute similarities/dissimilarities on three bipolar dimensions. (Additional dimensions did not appreciably alter the interpretation of results.) Results of the MDS analyses were similar to the results of factor analyses (conducted independently)--except that the latter yielded a strong first factor tentatively called "Intellectual Level." Attribute loadings on this factor ranged from .21 to .95; the median was .82. Since MDS analyses identify dimensions/factors that differentiate variables, it is not surprising that a general factor appeared only in the factor analyses.

Input from panel members indicated that several of the 16 attributes were especially difficult to rate (e.g., pleasant working environment, self-actualization). Hence, such attributes were eliminated and the MDS analyses were rerun. On the basis of the results of these analyses and further panel/staff discussion, a comprehensive subset of nine diverse attributes was identified. These nine attributes were considered to be candidates for use in a revision of DISCOVER.

To assist with the revision, a new panel of five experienced vocational psychologists was assembled. (Three of the panel members had been on the previous panel.) Panel/staff discussions resulted in refinements of attribute definitions. In addition, the panel developed a new 5-point rating scale addressing potential for experiencing a given attribute in a given occupation as compared to occupations in general. Essentially the same rating scale was used with eight of the nine attributes (the exception being earnings), and (by concensus) panel members assigned marker occupations to the five scale points for each attribute. These efforts were directed toward increasing rating accuracy and reducing attribute intercorrelations.

As before, panel members independently rated each of the 425 DISCOVER occupations on each of the attributes. To assess rating consistency across panel members, a coefficient alpha reliability estimate was calculated for each attribute. The coefficients ranged from .79 (for economic security) to .95 (for helping others); the median was .92.

To make the task of assessing attribute preferences easier for counselees using DISCOVER, the 5-point rating scale was collapsed to a 3-point scale through application of a complex set of inter-rater agreement criteria. Occupations meeting the criteria averaged about 90% across the attributes. Panel members rerated occupations on attributes for which the criteria were not met. After completion of the reratings, only 12 attribute-occupation combinations did not meet the agreement criteria. A panel member on ACT's staff resolved these disagreements after an intensive study of information on

the occupations. Descriptions of the nine attributes and the rating scales used in the analyses described below are provided in Appendix B1.

DISCOVER job characteristics. The nine occupational attributes in this component of DISCOVER had a quite different basis from those in the job values component. Essentially, they evolved over the years as a result of input DISCOVER's developers received from counselors who used DISCOVER. In this regard, they reflect additional attributes that counselors and counselees wish to take into account when searching for occupational options. Generally, the attributes are more concrete than attributes in DISCOVER's job values component. As a result, occupational ratings for these attributes can rely more on information commonly included in occupational descriptions--e.g., descriptions in the Occupational Outlook Handbook (OOH; U.S. Department of Labor, 1990).

An occupational analyst (the same person who resolved final-stage disagreements among the attribute ratings of panel members) rated each of the 425 DISCOVER occupations on each of the nine attributes (job characteristics). The attributes and rating scales are listed in Appendix B2. After the ratings were completed, the decision was made not to use two of the attributes (Work Tasks and Social Interaction) in DISCOVER because of redundance with attributes in DISCOVER job values component. Nevertheless, they were retained in the analyses reported here.

GOE work values. The GOE work values (hereafter called GOE attributes) used in this study included 18 of the 27 described by Harrington and O'Shea (1984). Because the total number of attributes (45) in the DISCOVER and GOE data bases was

relatively large, and because some of the GOE attributes (e.g., work with numbers) are not commonly found in the attribute literature, nine GOE attributes were not used in this study. Definitions of the 18 GOE attributes that were used are presented in Appendix B3. Harrington and O'Shea (1984) provided information on how occupations were rated on these attributes.

Analyses and Results

The rating scales used with the attributes covered by the data base varied across the attributes. For example, the GOE attributes were rated on a yes-no scale, whereas the DISCOVER attributes were rated on 1-2, 1-3, or 1-4 scales. Since the use of different rating scales would make it difficult to compare an occupation's ratings across attributes, ratings for the 36 DISCOVER and GOE attributes were standardized by converting each occupation's attribute ratings to z-scores. The mean and standard deviation for each attribute rating were obtained for the 425 occupations in the data base. These values were used to transform each rating to the z-score scale used in the analyses.

Differentiation of occupations. A principal components analysis based on the 36 attribute ratings for the 425 occupations yielded nine orthogonal factors (principal components) with eigenvalues greater than one. Factor loadings, eigenvalues, and percent of variance explained by the first four factors are presented in Table 2. The first factor, which was by far the most effective in differentiating the occupations (see percent variance explained), had high loadings for attributes such as the following: education level, recognition, variety, independence, intellectual stimulation, and prestige. Thus, this

factor appears to be similar to the "Intellectual Level" factor obtained in the previous analysis of occupational ratings. In Table 2, the first factor is labeled "Education Level" to reflect the high correlations between that attribute and the recognition, variety, etc. attributes. The correlations, among the highest in the inter-correlation matrix, ranged in the upper 60s (matrix is available on request). The Education Level factor is further supported by the results of a discriminant analysis that used education level as the classification variable and attributes as the discriminant variables (see, especially, the attribute loadings in Table 3).

Results of the principal components analysis leave little doubt that the 36 occupational attributes effectively differentiate individual occupations. However, an education level dimension accounts for more than one-fourth of the inter-occupational variance.

Differentiation of occupational groups via profiles. Mean z-scores for the 36 attributes included in the study were computed for occupations grouped by Holland's types (ACT Job Clusters) and job family. Figures A1 through A3 (Appendix A) show how Holland's types are differentiated by the 36 attributes. For example, the R type has the highest mean on 4 of the 36 attributes. The corresponding figures for the other types are as follows: I (6), A (9), S (5), E (11), and C (1). The C type and the R type (to a lesser extent) are primarily differentiated from the other types by low attribute scores.

The attribute profiles for job families (see Figures A4 through A6 for examples) indicate that, within most Holland types, job families have unique profiles. However, within the R and C types, the job family profiles tend to be parallel--though they differ

somewhat in level. Thus, for the R and C types, the predominant attributes tend to be similar across job families.

Tables 4-6, which show mean z-scores that equal or exceed 0.7 in absolute value, provide a summary of results for Holland's types and their job families. For example, the four highest means for the E type (Business Contact Job Cluster) were as follows: public contact, supervision, social interaction, and persuading (see Table 4). The predominant attributes for the two job families within this Holland type, though sensible, differed somewhat. Attributes characterizing C type job families tend to be similar across job families. However, two of the job families had only two attributes that met the mean score cut-off. Table 4 makes the substantial and sensible differences between E type and C type occupations readily evident. An analysis of results for the other four Holland types (Tables 5 and 6) is left to the reader.

Differentiation of occupational groups via discriminant analysis. In order to obtain a statistical summary of attribute differences across Holland's six types of occupations, a discriminant analysis was run using Holland's types as the classification variable. Various guidelines for determining sample size relative to number of groups and discriminant variables suggested that it would be appropriate to use only about 20 attributes in the analysis. Accordingly, 15 of the 36 attributes were eliminated, primarily on the basis of overlapping definitions. Preference was given to the retention of attributes in DISCOVER's Job Values component, since they were the most thoroughly defined).

Results of the discriminant analysis are summarized in Table 7, along with the results of a concomitant univariate analysis of variance (ANOVA). Holland's types were assigned equal weights in the analysis to avoid distortions due to an imbalance in the number of occupations per type (see Table 1). Hence, statistical significance tests do not strictly apply. Nevertheless, the significance levels associated with Wilks' lambda the ANOVA F values (see Table 7) leave little doubt that differences among Holland's types can not reasonably be attributed to chance. The ranks listed in the ANOVA section indicate which attributes did the best job of differentiating Holland's types when used in conjunction with the other attributes.

Five discriminant functions appear to be warranted by the data. Contrary to results of the principal components analysis, education level made only a weak contribution (10% of explained variance) to the differentiation of Holland's types (see attribute loadings for the fourth discriminant function). Because education level varies within each of Holland's types, its power as a differentiating variable was reduced.

Hit rates for predictions of membership in Holland's six types averaged 76%, as compared to a chance hit rate of 17%. Although the relatively small number of occupations (given the number of groups and variables) precluded using a cross-validation sample, the uniformly high hit rates across Holland's types suggest that each of the types was well-differentiated.

Finally, discriminant analyses were run, separately, for each of Holland's types, using job family as the classification variable. Because of the small number of occupations per job family relative to the number of attributes, a subset of eight

attributes was used in the analyses. These were attributes that appeared to be the most effective (and least redundant) in differentiating Holland's types, as determined from the discriminant analysis described above. To the extent that attributes which differentiate Holland's types also differentiate job families, this mode of selection capitalizes on chance. Thus, the results of statistical significance tests may not apply. Also, job family differentiation may be greater than that which would be observed for a cross-validation sample. Nevertheless, job family hit rates should be informative for the reasons cited below.

If the occupational attributes that differentiate Holland's types are not effective in differentiating job families, one would expect chance hit rates for discriminant analyses involving job families within Holland's types. Also, if two or more (but not all) job families within a type are highly similar, their hit rates for those job families should be substantially lower than the hit rates for the other job families within that type. Thus, the hit rate data provide a means for determining whether there are substantial differences in the attributes characterizing job families within each of Holland's types.

Results for the six discriminant analyses are summarized in Table 8. Wilks' lambdas, not shown, ranged from .09 ($p < .0001$) to .46 ($p < .001$) across Holland's six types. (Recall, however, that the selection of attributes may have capitalized on chance.) For each of Holland's types, the overall hit rate was substantially greater than chance. More important, in only one instance (Job Family G) did the observed hit rate for a job family approach the chance hit rate for its Holland type (R). Thus, it appears that occupational attributes that differentiate Holland's types also differentiate job families

within those types.

Taken together, results of the discriminant analyses suggest that a linkage between occupational attributes and the World-of-Work Map (WWM) is possible--but not at the level of Holland's types. Because the attributes differentiate job families within Holland's types (i.e., within ACT Job Clusters), a job cluster linkage might refer counselees to inappropriate job families. The data indicate that it would be more appropriate to link occupational attribute preferences to the WWM via job families.

Differentiations of education levels within job families. Whether, in fact, linkage at the job family level is feasible depends on the extent to which there are attribute pattern differences across education levels within job families. Recall that education level was one of the major attribute dimensions on which occupations differed, as shown by the principal components analyses described above. If there are substantial educational level differences in the attributes characterizing occupations within job families, then a WWM linkage may have to take education level into account. Because of the relatively small number of occupations in most job family-by-education level combinations, it was not possible to investigate this matter via discriminant analysis. However, Figures 8-19, discussed in the following section, suggest that education level differences are confined to only a few of the attributes recommended for use in DISCOVER. Thus, it may be possible to use the other attributes for a job family linkage independent of education level.

Implications for a Comprehensive Set of Occupational Attributes

Recommended Attributes

The purposes of this study were (a) to identify a comprehensive set of attributes that differentiate occupations and occupational groups and (b) to determine the feasibility of linking attribute preferences to the WWM. The 16 attributes identified on the basis of the literature review and study analyses--that is, the occupational attributes recommended for use in DISCOVER--are presented below.

Appendix C gives definitions for each of the 16 recommended attributes, and Table 9 presents a comparison of the recommended attributes with those in five widely used attribute inventories. The column headed "Rationale" refers, by number, to statements in Table 11 that explain the basis for recommending each of the attributes.

Table 9 makes clear that the recommended attributes are comprehensive and common to many of the widely used attribute preference inventories. Also, many have substantial research support. Table 10 presents attributes that are not recommended for use in DISCOVER because (a) they require knowledge of a person-job interaction (e.g., ability utilization); (b) they are not commonly found in the attribute literature (e.g., detachment); or (c) they demonstrate little ability to differentiate Holland's types, job families, and/or occupations (e.g., pressure on job).

Distinction Between Core and Education-related Attributes

Table 9 is divided into two sections. The first section contains attributes (called core attributes) that differentiate Holland's types, job families, and occupations but are not highly related to education level. The second section contains attributes (called

education-related attributes) that differentiate occupations primarily on the basis of the education level. The distinction between the core and education-related attributes can be seen in the results of the principal components analysis (Table 2) and the discriminant analysis for education level (Table 3). The attributes in the education-related section of Table 9 correlated highest with the first principal component and with the first discriminant function. But because the distinction between the correlations for attributes in the core and education-related categories is not always clear, the division of attributes into the two categories is somewhat arbitrary.

Summary of Results for Recommended Attributes

Table 12 presents the 16 recommended attributes, along with proxy attributes (i.e., attributes in the analyses described above that most closely match the recommended attributes.) Figure 1, which presents profiles for the recommended attributes (as determined from their proxies) by Holland type, is divided vertically into core (left side) and education-related (right side) attribute sections. Each Holland type tends to peak on a unique set of core attributes and to score low or lowest on other core attributes. Thus, the profiles frequently cross one another, an indication of the ability of core attributes to differentiate Holland's types. The education-related attributes tend to have much flatter profiles than do the core attributes. As expected, they primarily differentiate Holland's types by education level.

Figures 2 through 7 present profiles for the recommended attributes by job family within Holland type. These profiles illustrate how related job families differ on the recommended attributes. Job families in the R and C types have nearly parallel

attribute profiles, indicating that job families in these Holland types (ACT Job Clusters) are less differentiated than those in the other four types.

Figures 8-19 provide attribute profiles by education level within job family. Generally, sample sizes for the level-by-family categories are small, suggesting that some of the profiles may be unstable. (Results are not shown when there were fewer than five occupations in a level-by-family category.) There were no job families for which all three education levels met the cutoff for number of occupations. Only 12 of the 23 WWM job families had data sufficient to profile two education levels. Thus, Figures 8-19 show trends, at best. Nevertheless, it appears that profiles for the core attributes are generally more similar than profiles for the education-related attributes. Figure 8, which contrasts education levels 1 and 3 within Job Family A, probably provides the best example of this trend. Figure 9, which contrasts levels 2 and 3 for Job Family B, shows a similar pattern across all occupational attributes--core and education-level related. On the other hand, Figure 18 shows substantial differences for education levels 1 and 3 within Job Family V (Social and Government Services). An analysis of the other figures is left to the reader.

In summary, the results of this study indicate that occupational attributes differentiate job families within Holland's types (ACT Job Clusters). Occupations grouped by education level within job family tend to have similar core attribute profiles. However, data for a larger number of level-by-family combinations are needed before a conclusion can be drawn. Finally, the 16 occupational attributes recommended for use in DISCOVER appear to be inclusive and parsimonious. Taken together, these results

indicate that linking occupational attributes to the WWM via job families is feasible. Thus, it appears that the procedure used by DISCOVER to link counselee attribute preferences to occupations can be similar to the procedure currently used to link counselee interests and abilities to occupations.

Given study results, further research on a procedure for linking occupational attribute preferences to the WWM appears to be warranted. For example, expert ratings for each of the recommended attributes could be obtained for the 500 occupations scheduled for use in DISCOVER in 1992-93. If occupations grouped by DISCOVER job clusters and job families are differentiated at least as well as in this study, various WWM linkage procedures could be explored--e.g., a best-fit procedure that identifies job families (and, hence, WWM regions) most congruent with a counselee's attribute preferences. The possibility of weighting attribute preferences according to personal importance could also be explored.

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Table 1

Distribution of DISCOVER Occupations by Holland Type (Job Cluster), Job Family, and Education Level

Holland Type (Job Cluster) and Job Family	N	Education level[a]		
		1	2	3
Enterprising (Business Contact)	55	7	19	29
A. Marketing and Sales	15	6	4	5
B. Management and Planning	40	1	15	24
Conventional (Business Operations)	54	27	17	10
C. Records and Communications	18	8	9	1
D. Financial Transactions	14	7	1	6
E. Storage and Dispatching	11	7	1	36
F. Business Machine/Computer Operation	11	5	6	0
Realistic (Technical)	113	38	72	3
G. Vehicle Operations and Repair	19	11	7	1
H. Construction and Maintenance	25	4	21	0
I. Agriculture and Natural Resources	8	3	3	2
J. Crafts and Related Services	14	4	10	0
K. Home/Business Equipment Repair	8	2	6	0
L. Industrial Equipment Operation and Repair	39	14	25	0

(table continues)

Holland Type (Job Cluster) and Job Family	N	Education level[a]		
		1	2	3
Investigative (Science)	91	4	29	58
M. Engineering and Other Applied Technologies	40	3	17	20
N. Medical Specialties and Technologies	24	1	12	11
O. Natural Sciences and Mathematics	20	0	0	20
P. Social Sciences	7	0	0	7
Artistic (Arts)	38	6	11	21
Q. Applied Arts (Visual)	14	3	7	4
R. Creative/Performing Arts	8	2	3	3
S. Applied Arts (Written and Spoken)	16	1	1	14
Social (Social Service)	74	17	14	43
T. General Health Care	24	2	7	15
U. Education and Related Services	15	2	0	13
V. Social and Government Services	21	5	1	15
W. Personal/Customer Services	14	8	6	0

[a]Education levels are as follows: 1 = high school; 2 = up to 2 years education/training beyond high school; 3 = 4 or more years of college.

Table 2

Occupational Attribute Loadings on the First Four Principal Components

Attributes	First four components extracted: Education Level	Working with People	Work Setting	Unnamed
DISCOVER Job Characteristics				
Work setting	-.26	-.06	.57	.22
Work tasks	.81	.01	.10	.14
Work hours	.38	.41	.34	-.09
Supervision	.39	.15	.08	.26
Pressure on the job	.41	.45	-.08	.14
Physical danger	-.22	-.15	.51	.38
Social interaction	.48	.66	-.03	-.15
Travel	.21	.04	.61	-.10
Education level	.79	-.13	-.10	.23
DISCOVER Job Values				
Creativity	.69	-.21	.12	-.09
Recognition	.83	-.17	.05	.13
Helping others	.31	.63	-.31	.16
Economic security	.38	.08	-.31	.38
Working with people	.49	.68	-.12	.00
Variety	.82	.00	.09	.21
Independence	.80	-.12	.18	.13
Responsibility	.73	.10	.07	.37
Earnings	.72	-.28	.17	.23
GOE Work Values				
Adventure[a]	-.11	.21	.39	.35
Authority	-.02	.30	.41	.33
Competition	.14	.23	.41	-.51
Creativity/self-expression	.62	-.33	-.08	-.14
Flexible schedule	.39	.03	.12	-.60
Helping others	.31	.35	-.40	.03
High salary	.64	-.35	.13	-.24
Independence	.52	.12	-.03	-.22
Influencing others	.38	.17	-.07	-.17
Intellectual stimulation	.76	-.31	-.14	.02
Leadership	.15	.21	.22	.14
Outside work	-.30	-.12	.52	.08
Persuading	.15	.26	.34	-.55
Physical work	-.36	-.08	.46	-.00
Prestige	.75	-.37	-.03	.01
Public contact	.09	.53	.29	-.10
Recognition	.53	-.04	.14	-.46
Routine work	-.46	-.01	-.33	-.21
Variety	.75	-.37	-.01	-.24

(Table continues)

Attributes	First four components extracted: Education Level	Working with People	Work Setting	Unnamed
	Summary Statistics			
Eigenvalue	10.2	3.3	3.0	2.5
% Variance	28%	9%	8%	7%
Cumulative %	28%	37%	45%	51%

[a]This attribute was inadvertently included in the analysis.

Table 3

Differentiation, by Selected Occupational Attributes, of Occupations Grouped by Education Level

Attribute	Univariate F	Discriminant function correlations 1st	2nd
DISCOVER Job Characteristics			
Work setting	11.1[a]	-.25	.13
Work hours	11.8[a]	.23	.11
Supervision	28.1[a]	.37	.02
Pressure on job	12.9[a]	.28	.07
Travel	2.2	.13	.13
DISCOVER Job Values			
Creativity	96.2[a]	.65	.06
Recognition	196.1[a]	.80	-.21
Helping others	27.8[a]	.39	.15
Economic security	37.2[a]	.43	-.36
Working with people	28.6[a]	.39	.27
Variety	197.1[a]	.80	-.21
Independence	189.8[a]	.80	-.19
Responsibility	134.4[a]	.72	-.17
Earnings	187.4[a]	.80	-.11
GOE Work Values			
Authority	1.0	.00	.20
Competition	1.8	.03	.25
Flexible schedule	3.1	.13	.11
Physical work	24.8[a]	-.33	.43
Prestige	172.9[a]	.77	.29
Public contact	0.6	-.04	.12

Summary Statistics

Wilks' lambda[a]: .23; variance-explained index: 77%

Among group variance for two[a] functions: 95%, 5%

Note. The 425 occupations were grouped into three education levels on the basis of typical worker preparation: High school; some education beyond high school but less than 4 years ; and a 4-year college degree or beyond.

[a]$p < .0001$.

Table 4
Summary of Attributes Characterizing Occupations Grouped by Holland's E and C Types and Job Families

	E[a] (Business Contact)			C[a] (Business Operations)				
Attributes	Total	A	B	Total	C	D	E	F
DISCOVER Job Characteristics								
Work setting			-0.7		-0.9	-0.8		-1.0
Work tasks	0.8		1.0		-0.7			-1.0
Work hours		0.9						
Supervision	1.1		1.6					
Pressure on the job								
Physical danger								
Social interaction	1.0	1.1	0.9					-0.9
Travel		0.9						
Education level					-0.7			-0.8
DISCOVER Job Values								
Creativity					-0.7			-0.8
Recognition								-1.1
Helping others								
Economic security		-0.7						
Working with people								-1.1
Variety			0.8	-0.8				-1.3
Independence	0.7		0.9	-1.0	-1.0		-0.9	-1.4
Responsibility			0.9	-0.7	-0.8			-1.4
Earnings			0.7	-0.8	-1.1			-1.1
GOE[b] Work Values								
Authority								
Competition	0.8	2.8						
Creativity/self-expression								
Flexible schedule		1.4						
Helping others								
High salary		0.9						
Independence								
Influencing others								
Intellectual stimulation								
Leadership	0.7		1.1					
Outside work								
Persuading	1.0	3.0						
Physical work								
Prestige								
Public contact	1.3	1.3	1.2					
Recognition								
Routine work				1.3	1.2	0.9	1.2	1.8
Variety								

Note. Table shows mean z-scores whenever they equal or exceed 0.7 in absolute value.
[a]E = Enterprising; C = Conventional. DISCOVER job clusters are shown in parentheses. See Table 1 for explanation of abbreviations for job families. [b]GOE = Guide for Occupational Exploration.

Table 5

Summary of Attributes Characterizing Occupations Grouped by Holland's R and I Types and Job Families

	R[a] (Technical)							I[a] (Science)				
Attributes	Total	G	H	I	J	K	L	Total	M	N	O	P
DISCOVER Job Characteristics												
Work setting		0.8	1.2	2.0								-1.0
Work tasks	-0.8		-0.9		-1.0	-1.0	-0.8				1.0	1.0
Work hours												
Supervision												
Pressure on job												
Physical danger	0.8		1.0	1.6			1.0					
Social interaction	-0.8		-0.9		-0.9	-0.9	-0.9		-0.9		-0.9	1.1
Travel				0.7		0.7						0.9
Education level		0.9									1.1	1.1
DISC. Job Values												
Creativity		-0.8				-0.8					0.8	0.7
Recognition					-0.8	-0.7	-0.7	0.7			1.3	1.1
Helping others										1.2		
Economic security				-0.8						0.8		
Working--people	-0.8		-0.9		-1.1	-1.1	-0.9				-0.8	
Variety	-0.7	-0.8			-0.7		-1.0				1.0	1.0
Independence							-0.9				1.2	1.2
Responsibility					-0.7							
Earnings					-0.8						1.2	1.0
GOE Work Values												
Authority												
Competition												
Creativity/express.											1.5	0.9
Flexible schedule												
Helping others										1.6		
High salary											1.7	
Independence				0.7								1.6
Influencing												
Intellectual stim.											1.5	1.2
Leadership				0.8								
Outside work			1.0	2.8								
Persuading												
Physical work			0.9	1.3								
Prestige											1.5	1.2
Public contact												
Recognition												
Routine work												
Variety											1.6	1.0

Note. Table shows mean *z*-scores whenever they equal or exceed 0.7 in absolute value.
[a]R = Realistic; I = Investigative.

Table 6

Summary of Attributes Characterizing Occupations Grouped by Holland's A and S Types and Job Families

	A[a] (Arts)				S[a] (Social Service)				
Attributes	Total	Q	R	S	Total	T	U	V	W
DISCOVER Job Characteristics									
Work setting									
Work tasks			0.7	0.7					-1.0
Work hours			1.7				1.2		
Supervision							1.6		
Pressure on job					0.8	1.4		0.9	
Physical danger									
Social interaction			0.8	1.0	0.9	0.8	1.1	0.9	0.8
Travel			1.6	0.8					
Education level				0.9			0.8		-0.9
DISCOVER Job Values									
Creativity	1.8	1.8	2.3	1.4					
Recognition	0.7		1.0	0.8					-1.1
Helping others					1.4	1.8	1.9	1.1	
Economic security			-1.5			0.8			
Working with people					1.2	1.3	1.4	0.9	1.0
Variety			0.9				0.8		-0.9
Independence		0.7							-0.8
Responsibility							0.8		-1.0
Earnings									-1.2
GOE Work Values									
Authority								2.5	
Competition									
Creativity/expression	1.2	1.1	1.2	1.2					
Flexible schedule	1.6	1.6	2.6	1.1					
Helping others					1.0	2.3	0.8		
High salary			0.8	0.8					
Independence	0.8		1.4	1.5		0.8			
Influencing others	1.0			2.5			1.7	0.9	
Intellectual stimulation				1.1					
Leadership			1.1				0.7	0.8	
Outside work									
Persuading				1.0					
Physical work									0.9
Prestige			1.0	1.0					
Public contact								0.9	1.6
Recognition	1.8	1.2	2.1	2.1					
Routine work									
Variety	1.1	1.0	1.1	1.3					

Note. Table shows mean z-scores whenever they equal or exceed 0.7 in absolute value.
[a]A = Arts; S = Social.

Table 7

Differentiation, by Selected Attributes, of Holland's Types (Job Clusters)

Attribute	Univariate ANOVA[a]		Correlation with fourth function[b]
	F[c]	Rank	
DISCOVER Job Characteristics			
Work setting	20.0	5	.23
Work hours	25.8	20	.00
Supervision	22.1	6	.06
Pressure on job	15.4	15	.08
Travel	9.4	9	.02
Education level	22.4	21	.59
DISCOVER Job Values			
Creativity	88.1	1	.28
Recognition	40.7	11	.65
Helping others	56.9	7	.13
Economic security	14.8	10	.40
Working with people	60.8	8	.12
Variety	48.2	17	.63
Independence	49.1	12	.66
Responsibility	24.9	19	.50
Earnings	25.8	16	.64
GOE Work Values			
Authority	9.4	4	.03
Competition	9.4	14	-.03
Flexible schedule	38.9	3	-.03
Physical work	10.0	13	-.09
Prestige	18.5	18	.47
Public contact	37.7	2	-.22

Summary Statistics

Wilks' lambda[c]: .04; variance-explained index: 96%
Among group variance for five[c] functions: 35%, 29%, 19%, 10%, 7%
Hit rate: R (73%), I (68%), A (66%), S (85%), C (87%), E (74%), Total (76%).

[a]ANOVA = one-way analysis of variance. Rank of unique contribution to group differentiation is shown (see Huberty, 1984). [b]Fourth discriminant function. [c]$p < .0001$. Job clusters were equally weighted in the analyses. Hence, statistical significance tests do not strictly apply.

Table 8

Differentiation, by Selected Attributes, of Job Families Within Holland's Types (Job Clusters)

Holland's types			Overall hit rate (%)		Range of hit rates (%)	
Label	N	Job family N	Chance	Observed[a]	Low	High
E	55	2	50	90	80 (A)	100 (B)
C	54	4	25	66	43 (D)	82 (F)
R	113	6	17	54	26 (G)	88 (I)
I	91	4	25	89	85 (M)	95 (O)
A	38	3	33	72	56 (S)	88 (R)
S	74	4	25	78	67 (V)	86 (W)

Note. Results are based on separate discriminant analyses for each of Holland's (1985) types of occupations.
[a]Average hit rate for job families in Holland type. [b]Job family with hit rate is shown in parenthesis. See Table 1 for explanation of abbreviations.

Table 9

Comparison of Recommended Attributes with Those in DISCOVER and in Four Other Established Inventories

Attributes in DISCOVER			Attributes in other inventories			
Recommended	Rationale[a]	Current	WAPS[b]	ASVAB[c]	MIQ[d]	VS[e]
			Core attributes			
Public contact	2 7	Working with people Social interaction		Public contact		Social interaction Social relations
Influencing others	7					
Authority	1 2 5 6 7	Supervision Responsibility	Management	Responsibility	Authority Supervision-human Supervision-tech. Responsibility	Authority
Helping others	1 2 3 4 5 6 7	Helping others	Altruism	Altruism	Social service	Altruism
Flexible schedule	7	Work hours				
Creativity	1 2 3 5 6 7	Creativity	Creativity	Creativity	Creativity	Creativity
Travel	7	Travel				
Work setting	1 2 4 7	Work setting	Surroundings	Outdoor work	Working conditions	Working conditions
Physical activity	1 7		Physical activity	Little/Challenging physical activity	Activity	Physical prowess Physical activity
Job security	1 2 7	Economic security	Security	Security	Security	Economic security
Job opportunities	9	Employment outlook[f]				
			Education-related attributes			
Prestige	1 2 3 5 7 8	Recognition	Prestige	Prestige	Social status	Prestige
Earnings	1 3 5 7 8	Earnings Beginning income[f]	Money	Income	Compensation	Economic rewards
Independence	1 2 3 4 5 6 7 8	Independence	Independence	Independence	Independence Autonomy	Autonomy
Variety	1 5 7 8	Variety; Work tasks		Variety	Variety	Variety
Education level	7 8	Education level				

[a]Rationale refers to the numbered statements in Table 11. [b]Work Aspect Preference Inventory (Pryor, 1987). [c]Armed Services Vocational Aptitude Battery (Wall & Zytowski, 1991). [d]Minnesota Importance Questionnaire (Dawis & Lofquist, 1984). [e]Values Survey (Nevill & Super, 1986). [f]Attribute was added to DISCOVER subsequent to ratings of job characteristics described in DISCOVER Variables section of report.

Table 10

Attributes in DISCOVER and Other Attribute Inventories But Not Recommended

DISCOVER	WAPS[a]	ASVAB[b]	MIQ[c]	VS[d]
Pressure on job				
	Detachment			
Physical danger				Risk
		Challenge	Ability utilization	Ability utilization
			Achievement	Achievement
			Advancement	Advancement
			Recognition	
	Life-style			Life-style
		Permit leisure time		
			Company policies	
		Working in a group		
				Aesthetics
	Co-workers		Co-workers	
			Moral values	
				Cultural identity
	Self-development			Personal development

[a]Work Aspect Preference Inventory (Pryor, 1987). [b]Armed Services Vocational Aptitude Battery (Wall & Zytowski, 1991). [c]Minnesota Importance Questionnaire (Dawis & Lofquist, 1984). [d]Values Survey (Nevill & Super, 1986).

Table 11

Rationale for Recommended Attributes

1.	These attributes were found to be common to three of four widely used instruments (WAPS, ASVAB, MIQ, and VS).
2.	These attributes were found to be common across four instruments used by Macnab & Fitzsimmons (1987).
3.	These attributes differentiated occupations grouped by Holland type (Rounds, Shubsachs, Dawis, and Lofquist, 1978).
4.	These attributes differentiated people on one of the following three preference factors: External Environment, People, and Intrinsic or Self-motivation (Lofquist & Dawis, 1978).
5.	These attributes differentiated occupations on one of the following three factors: Achievement-Autonomy, Safety-Comfort, and Altruism (Shubsachs, Rounds, Dawis, & Lofquist, 1978).
6.	These attributes differentiated people on one of the following three factors: Non-work Orientation, Human/Personal Concern, and Freedom (Pryor, 1987).
7.	These attributes differentiate job clusters and job families as indicated by the results of the study analyses.
8.	These attributes differentiate occupations by education level as indicated by the results of the study analyses.
9.	This attribute is sometimes subsumed by job security. It was separately identified because employment outlook is often considered separately in career exploration.

Note. These rationale statements are indexed to the recommended attributes listed in Table 9.

Table 12

Recommended Attributes and Their Proxies

Recommended Attributes	Proxy Attributes[a]
Core Attributes	
Public contact	Working with people
Influencing others	Persuading others[b]
Authority	Responsibility
Helping others	Helping others
Flexible schedule	Work hours
Creativity	Creativity
Travel	Travel
Work setting	Work setting
Physical activity	Physical work[b]
Job security	Economic security
Job opportunities	No proxy
Education-related Attributes	
Prestige	Recognition
Earnings	Earnings
Independence	Independence
Variety	Variety
Education Level	Education Level

[a]Proxy attributes are those attributes in the study analyses that most closely match the recommended attributes. [b]This proxy was one of the 18 work values drawn from the Guide for Occupational Exploration (Harrington & O'Shea, 1984).

Figure 1. Profile of recommended DISCOVER attributes for occupations grouped by Holland's types.

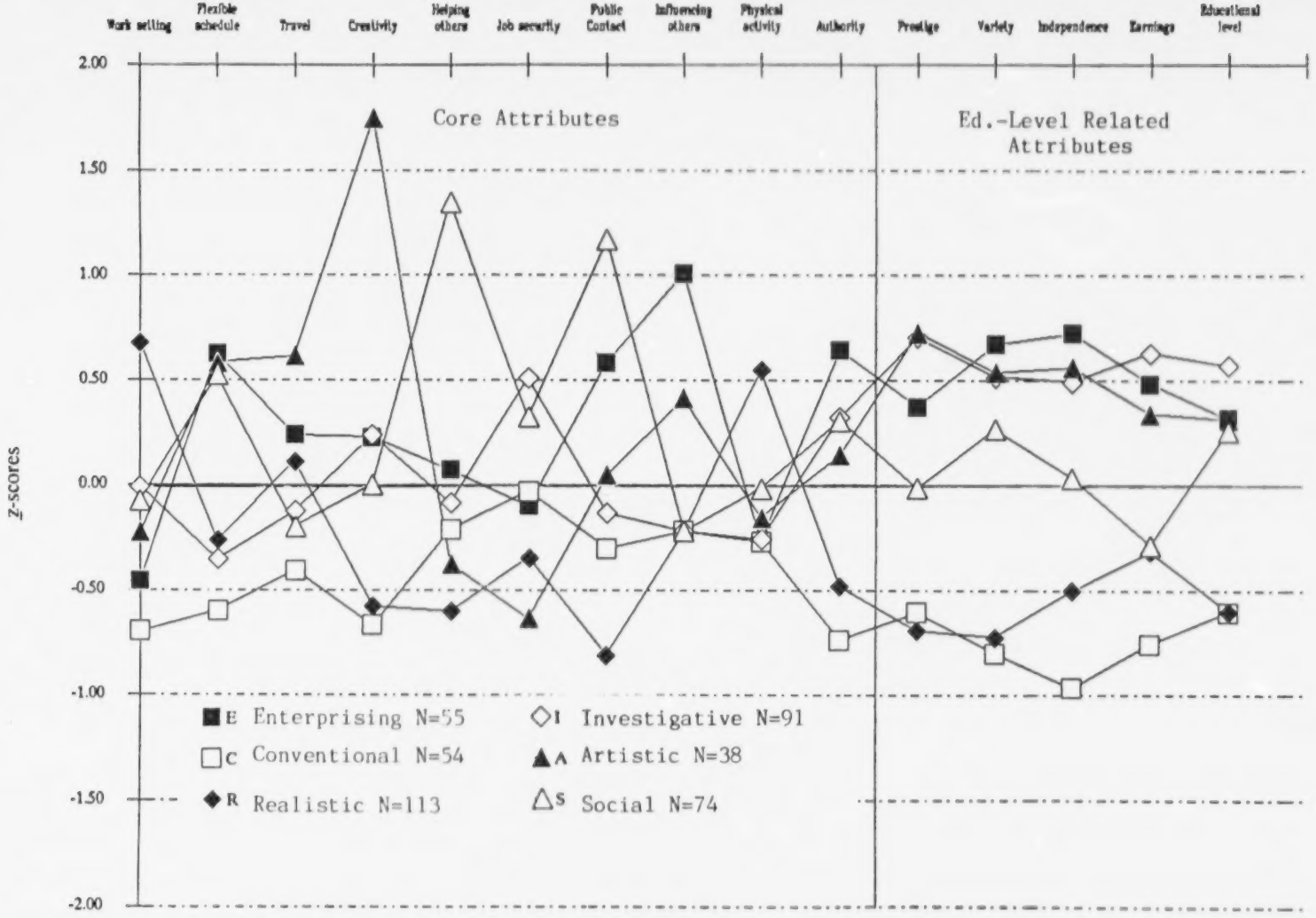

Figure 2. Profile of recommended DISCOVER attributes for occupations grouped by job family within the Enterprising type.

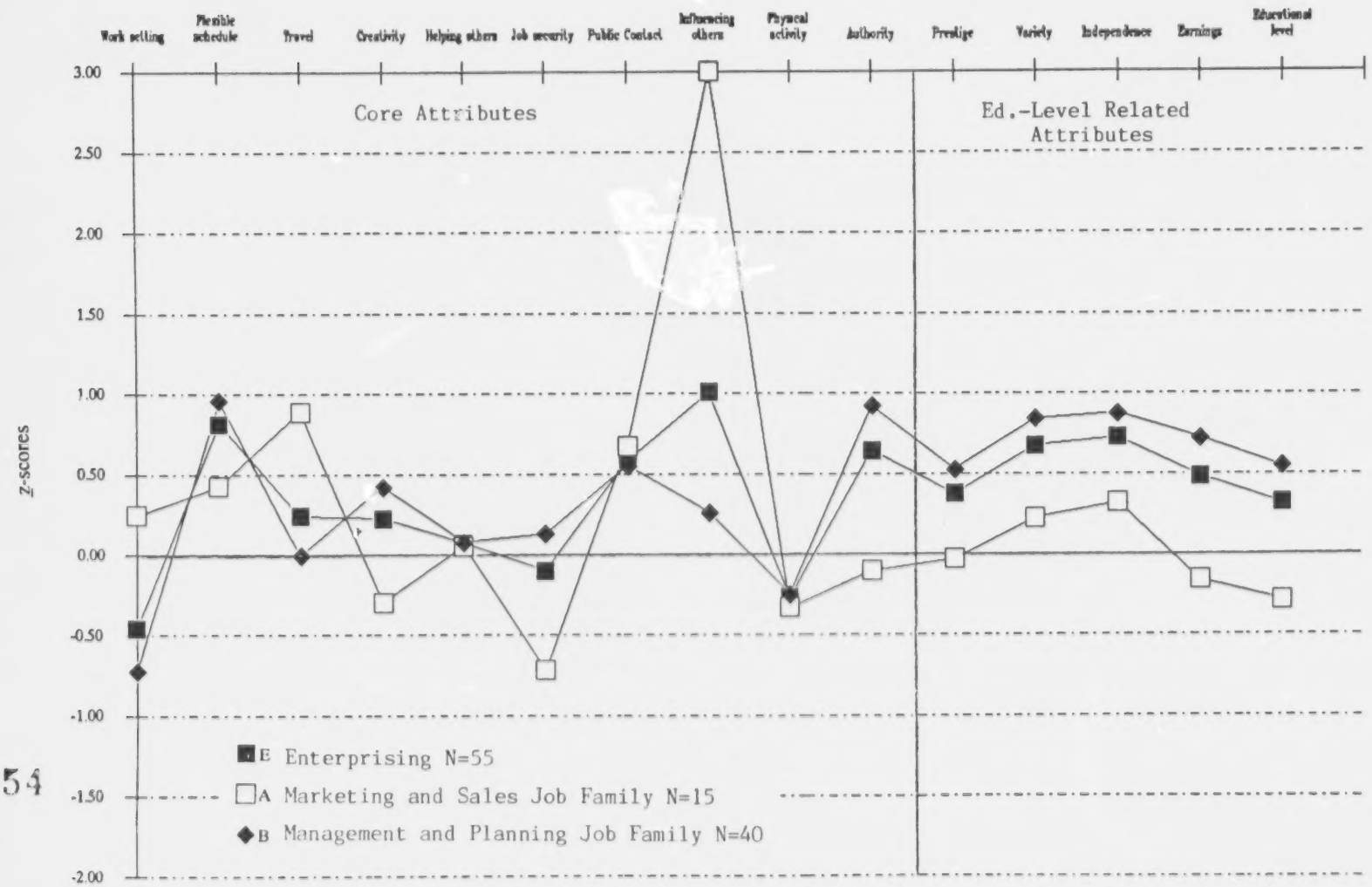

Figure 3. Profile of recommended DISCOVER attributes for occupations grouped by job family within the Conventional type.

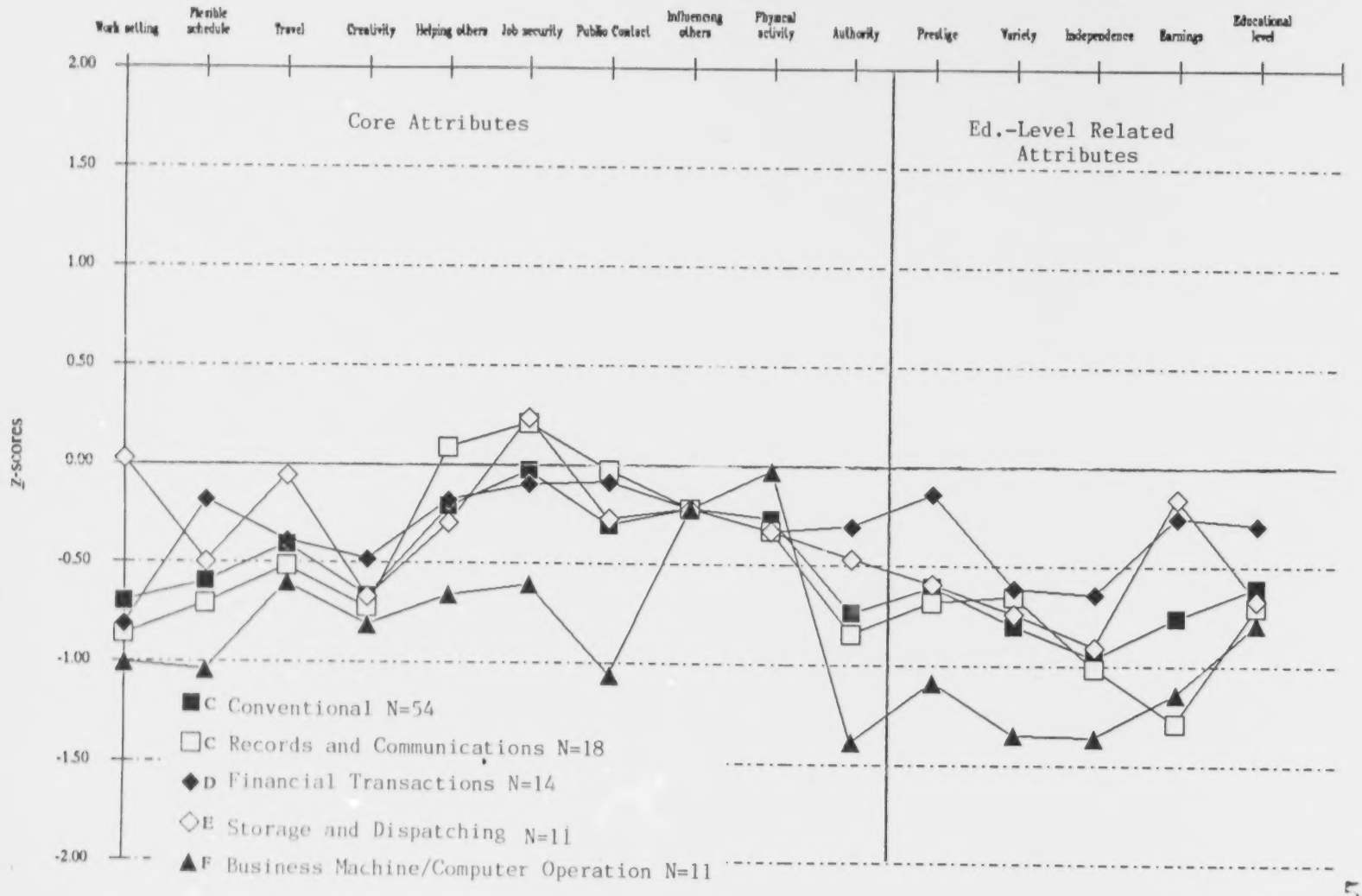

Figure 4. Profile of recommended DISCOVER attributes for occupations grouped by job family within the Realistic type.

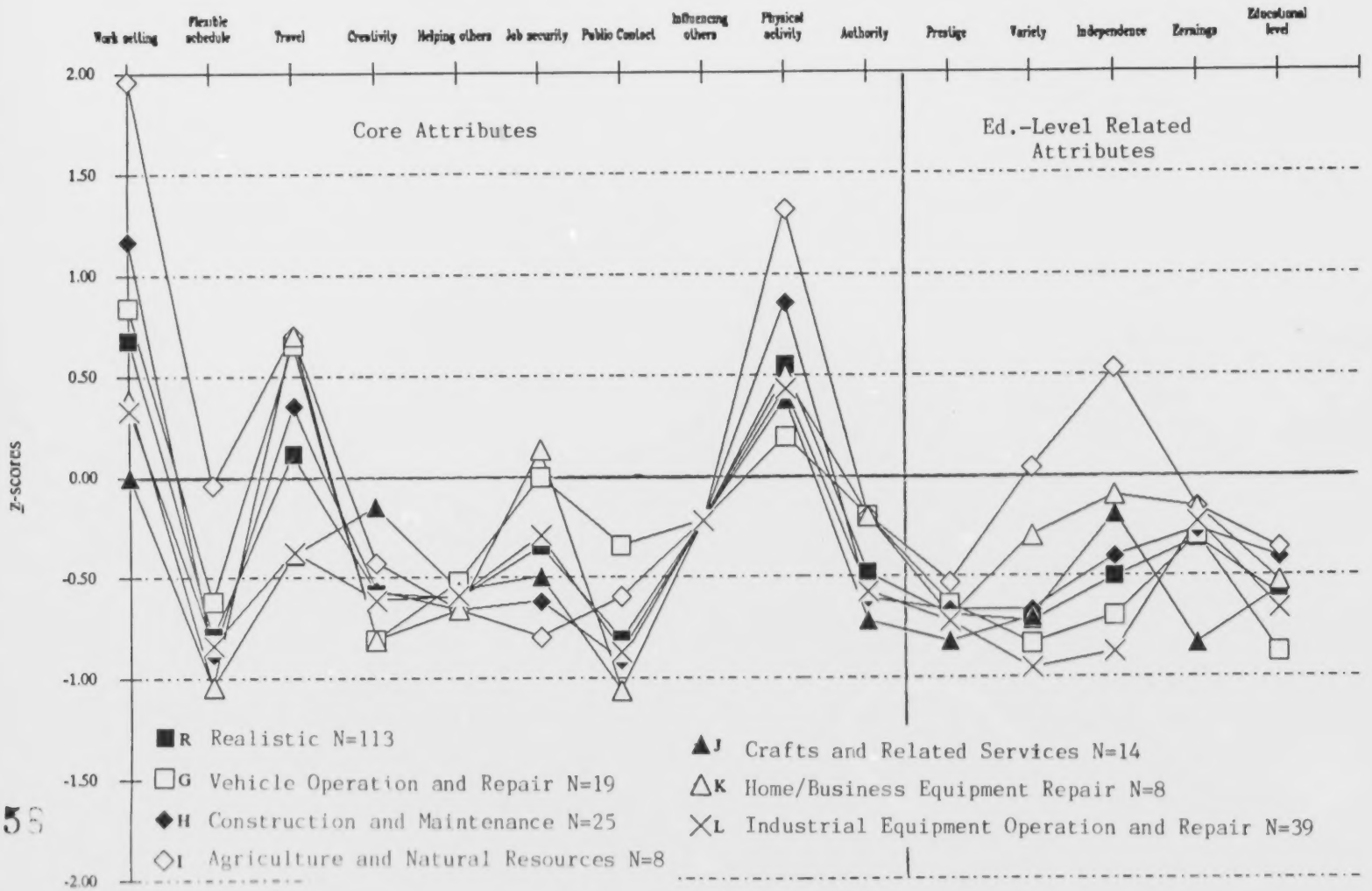

Figure 5. Profile of recommended DISCOVER attributes for occupations grouped by job family within the Investigative type.

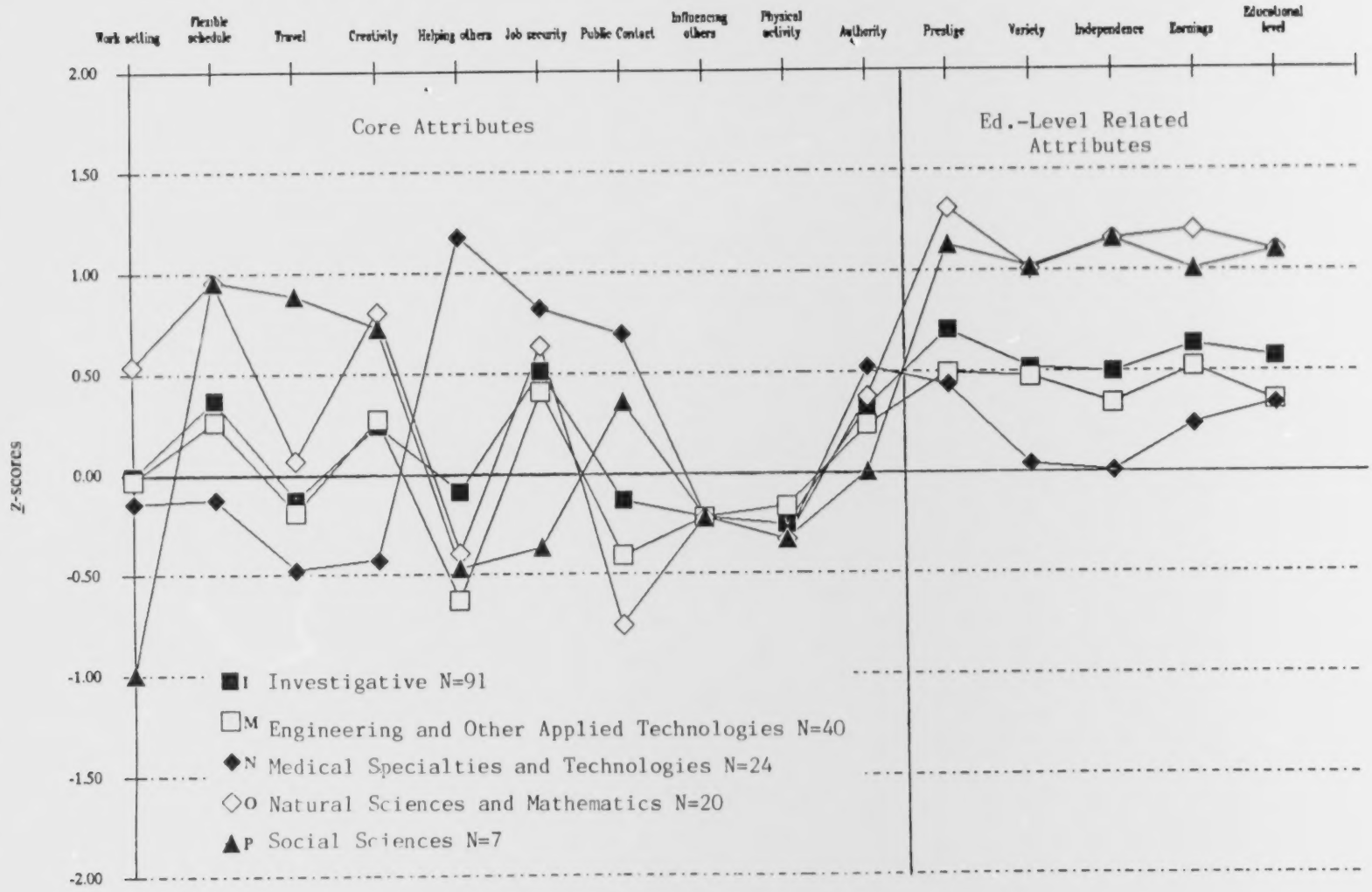

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Figure 6. Profile of recommended DISCOVER attributes for occupations grouped by job family within the Artistic type.

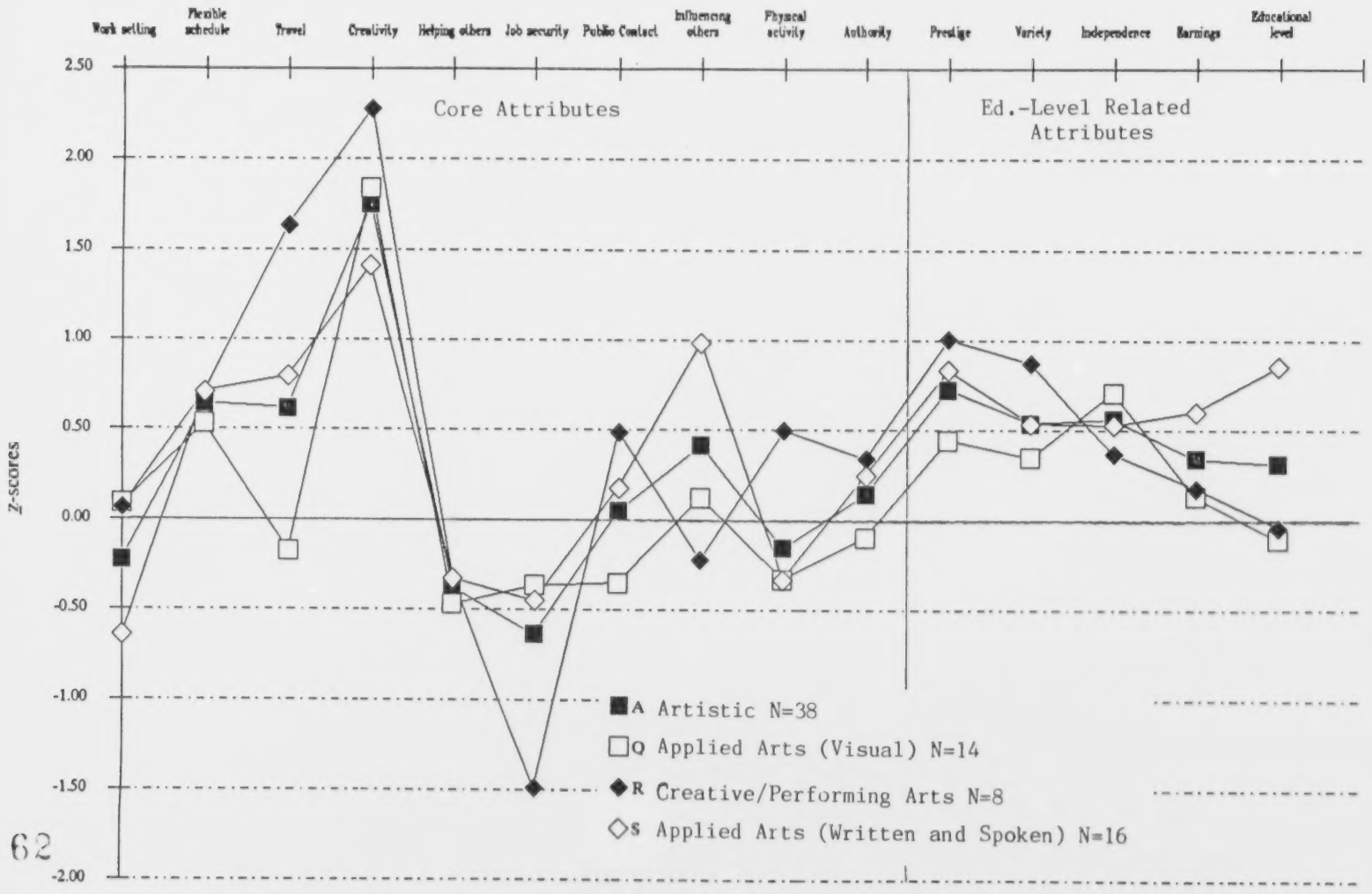


Figure 7. Profile of recommended DISCOVER attributes for occupations grouped by job family within the Social type.

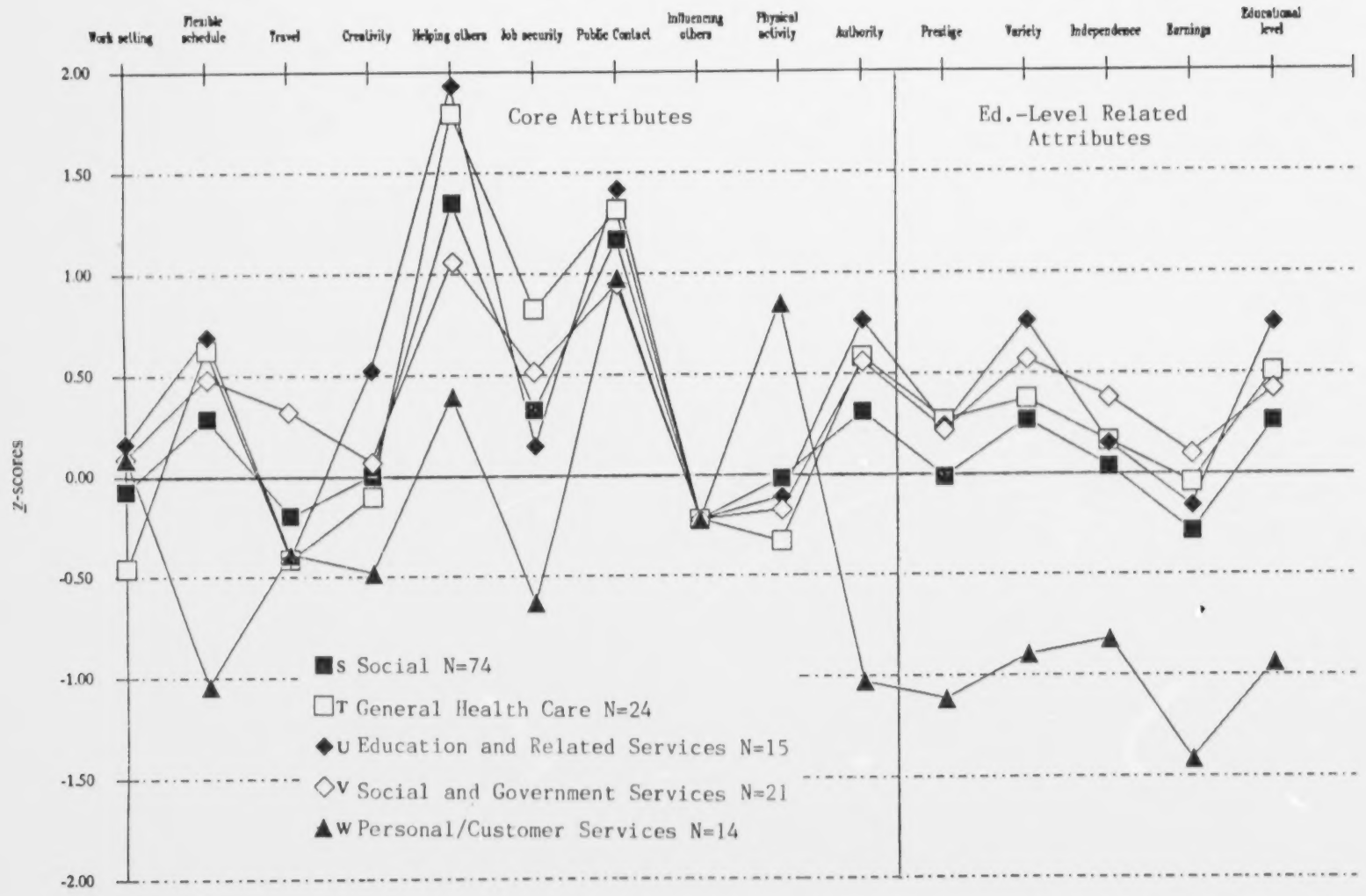


Figure 8. Profile of Recommended DISCOVER attributes for occupations (N > 4) grouped by education level within Job Family A (Marketing and Sales).

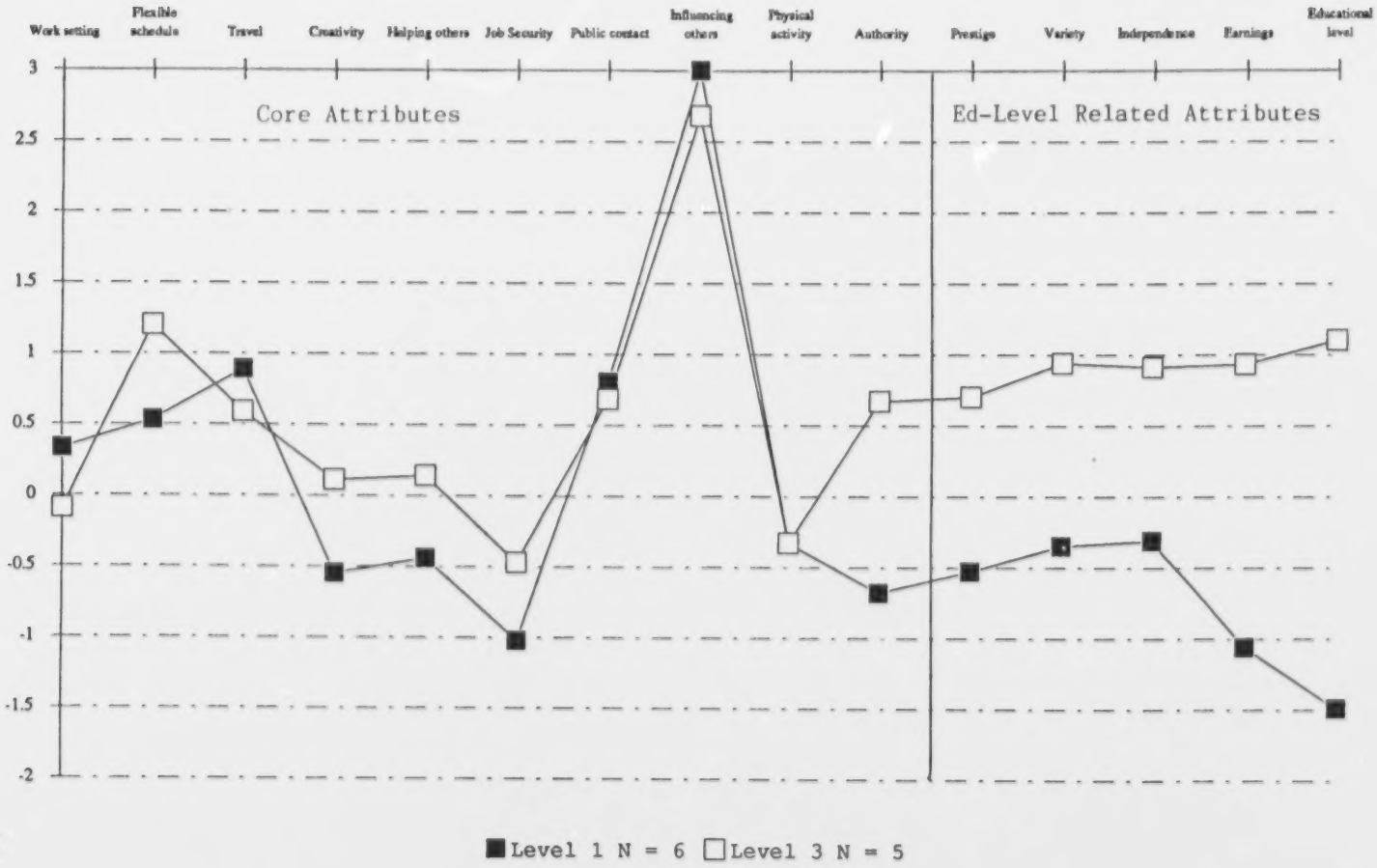


Figure 9. Profile of Recommended DISCOVER attributes for occupations (N > 4) grouped by education level within Job Family B (Management and Planning).

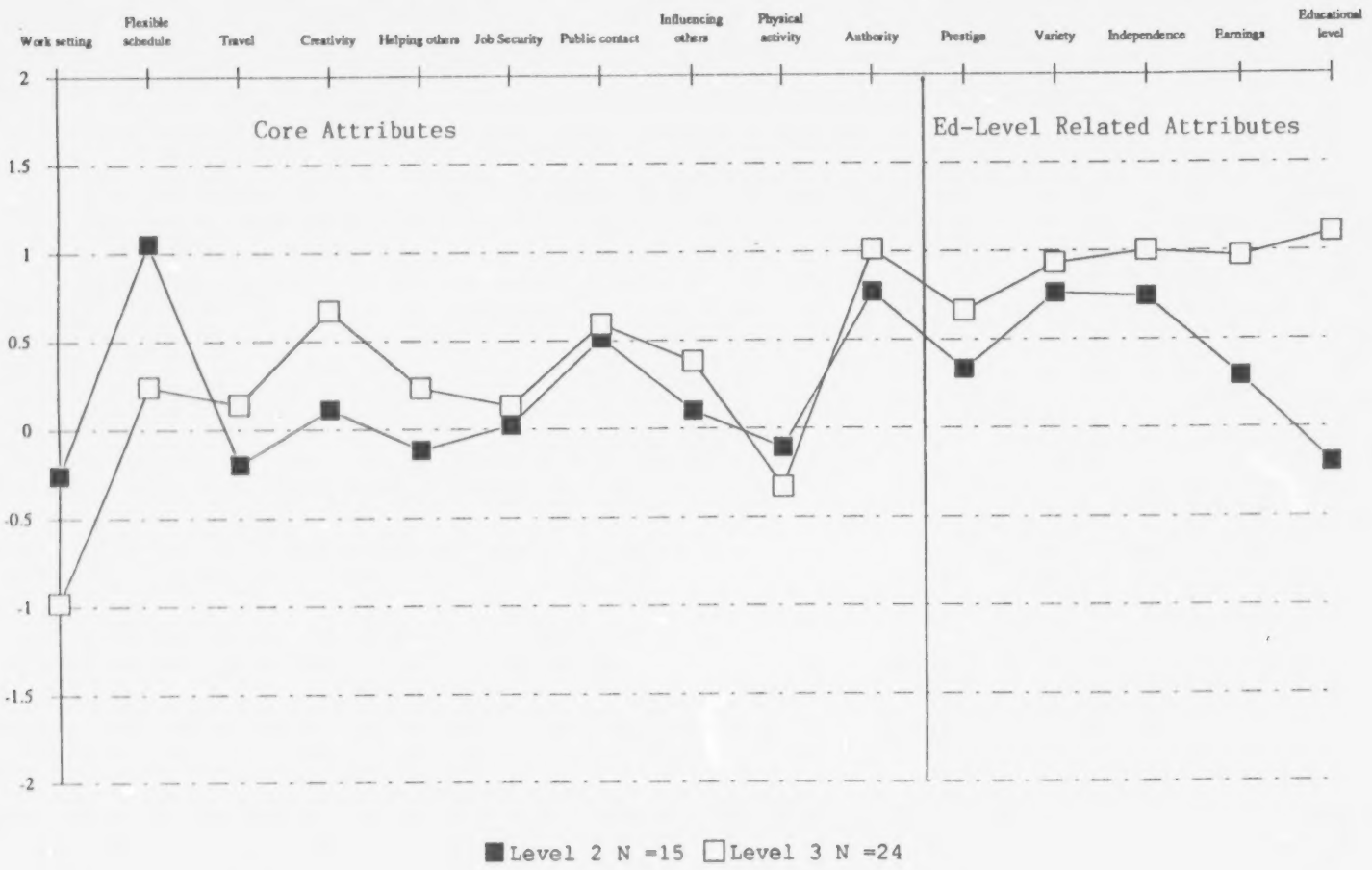


Figure 10. Profile of Recommended DISCOVER attributes for occupations (N > 4) grouped by education level within Job Family C (Records and Communications).

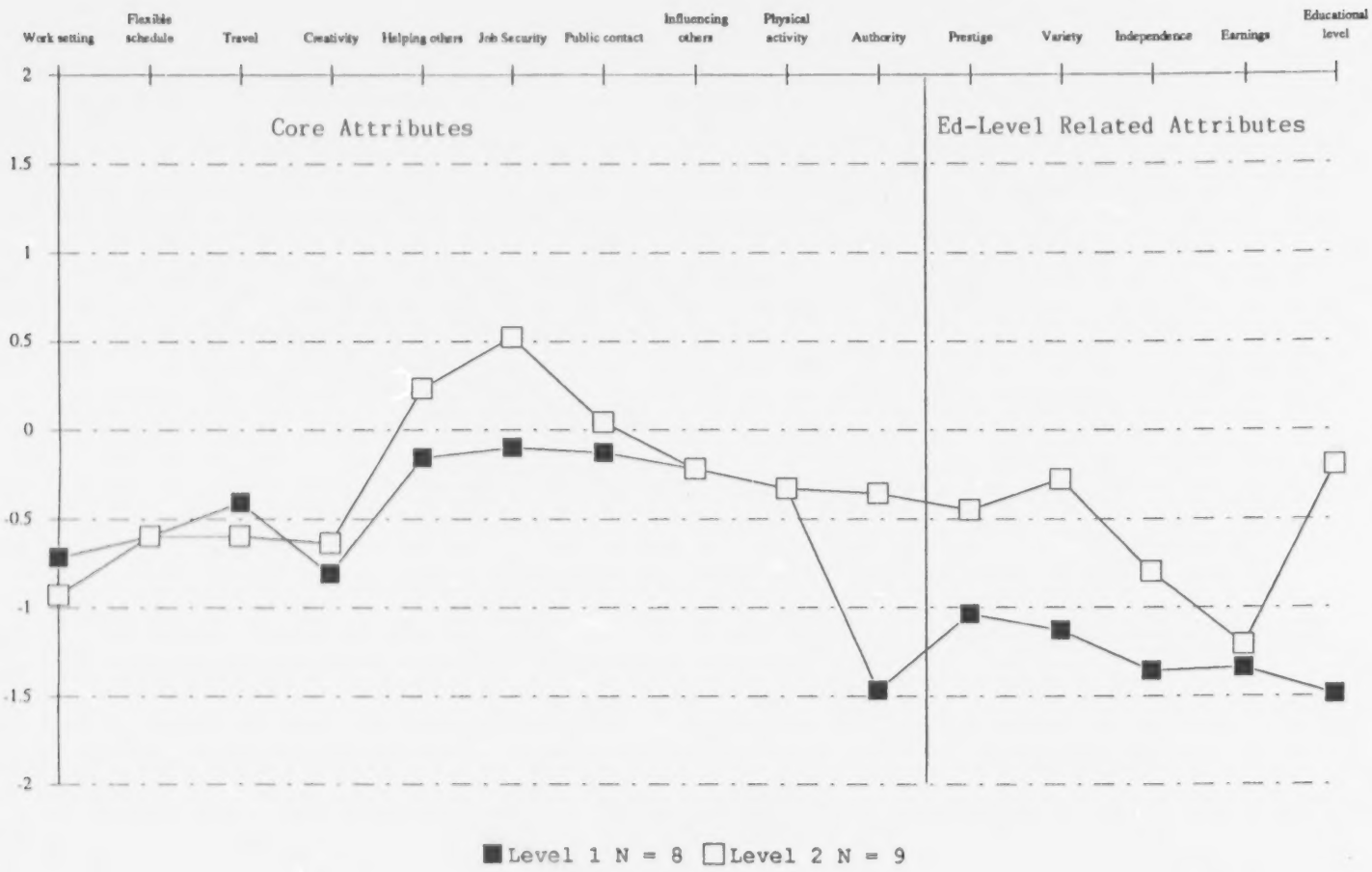


Figure 11. Profile of Recommended DISCOVER attributes for occupations (N > 4) grouped by education level within Job Family D (Financial Transactions).

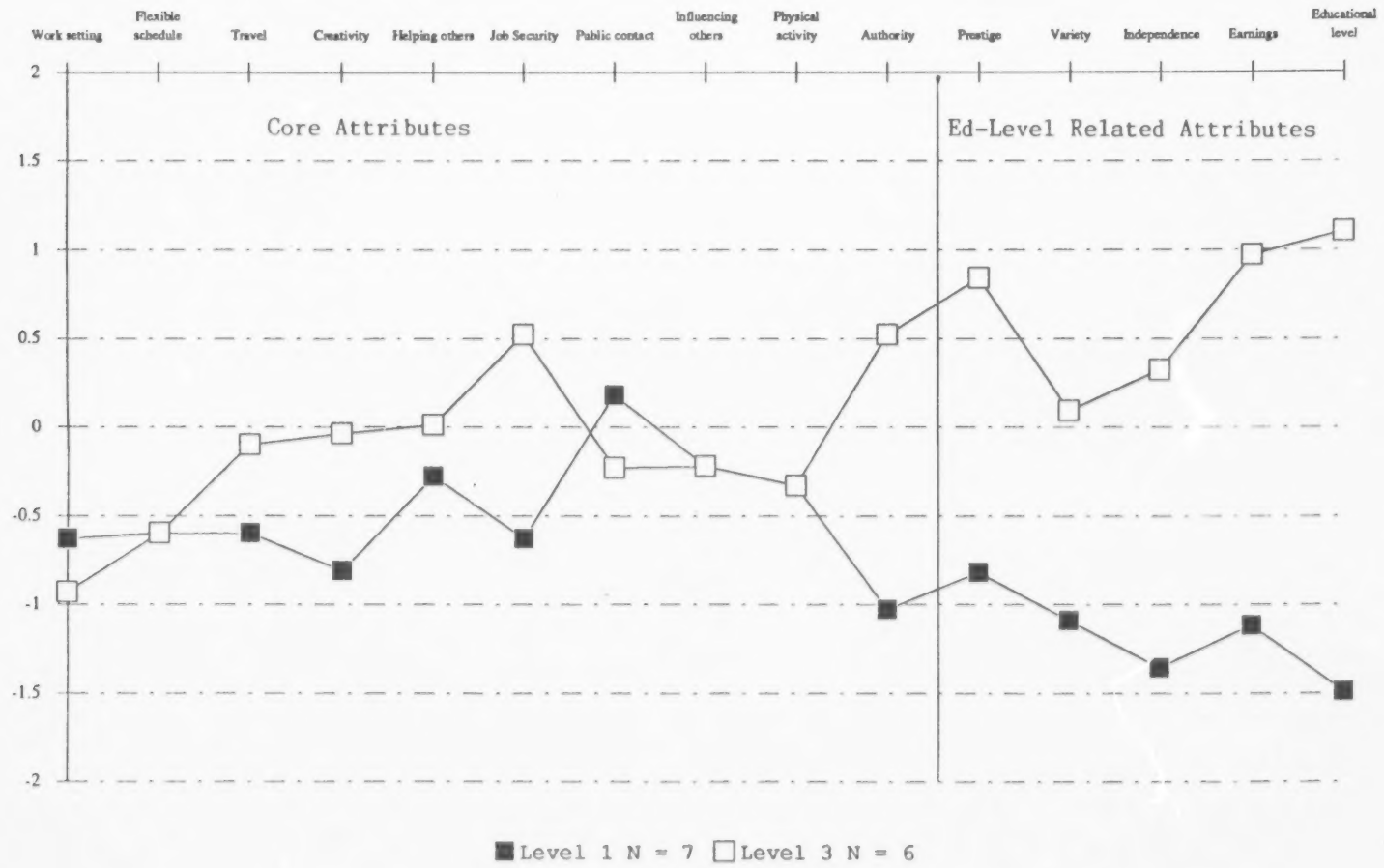


Figure 12. Profile of Recommended DISCOVER attributes for occupations (N > 4) grouped by education level within Job Family F (Business Machine/Computer Operation).

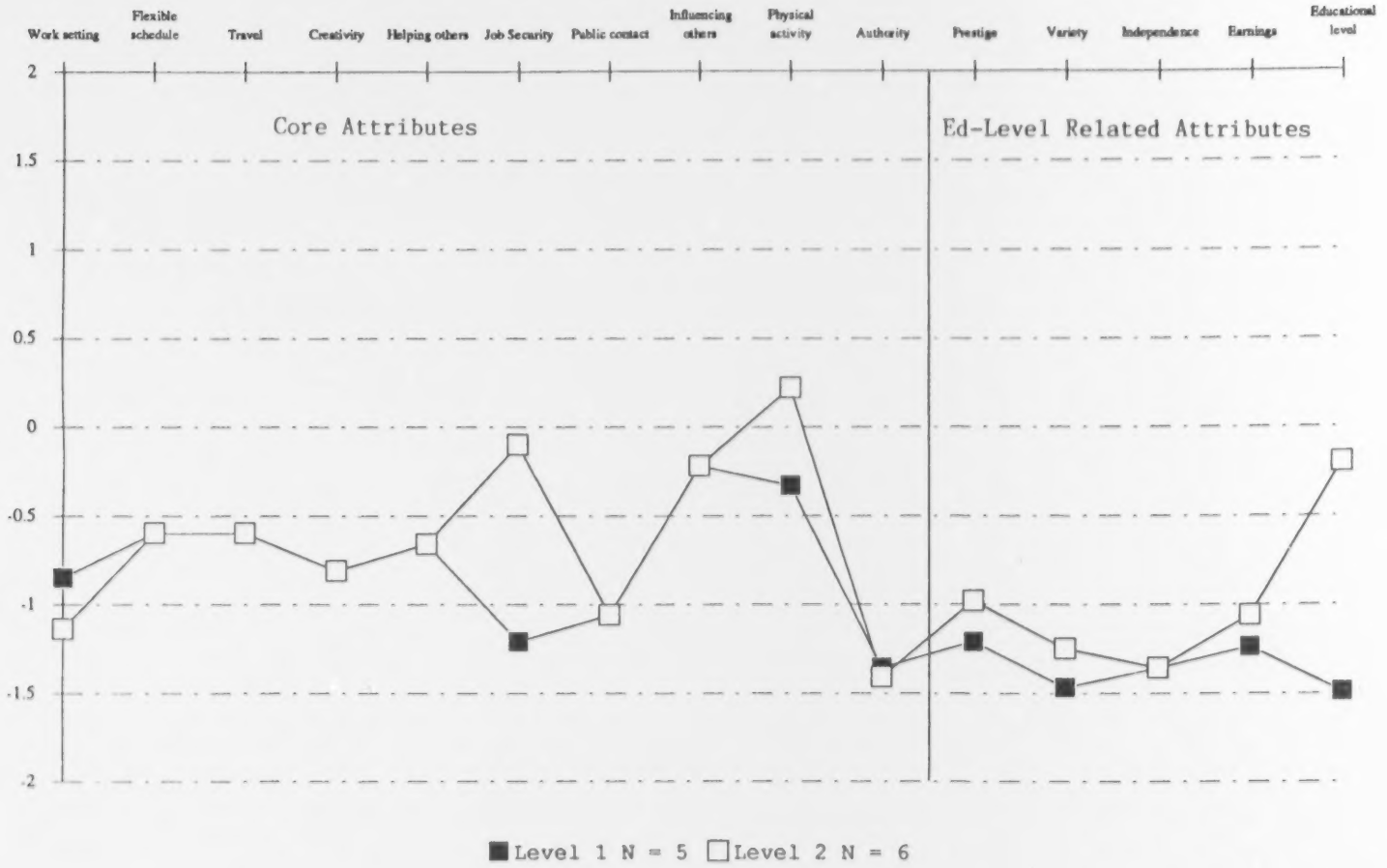


Figure 13. Profile of Recommended DISCOVER attributes for occupations (N > 4) grouped by education level within Job Family G (Vehicle Operation and Repair).

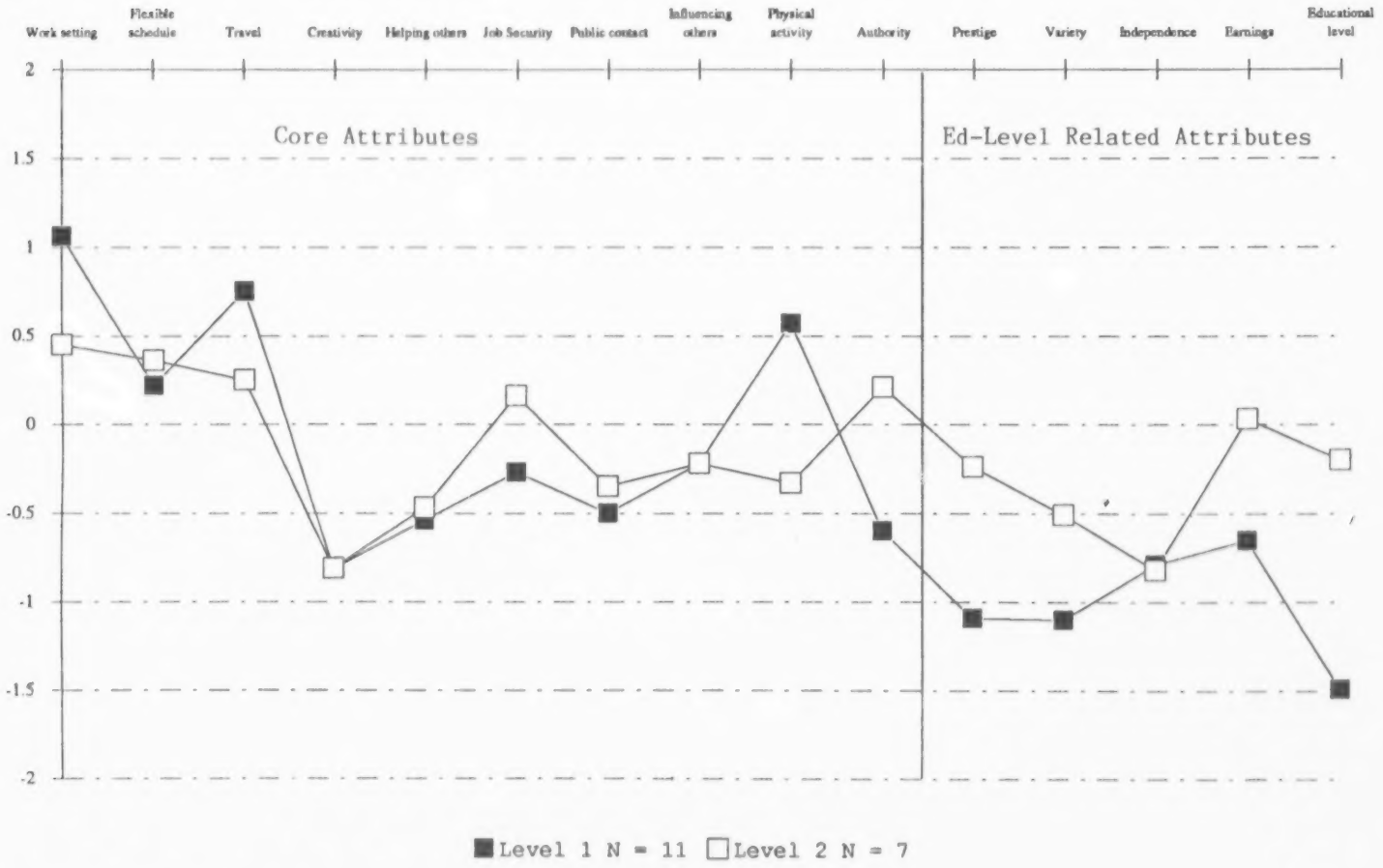


Figure 14. Profile of Recommended DISCOVER attributes for occupations (N > 4) grouped by education level within Job Family L (Industrial Equipment Operation and Repair).

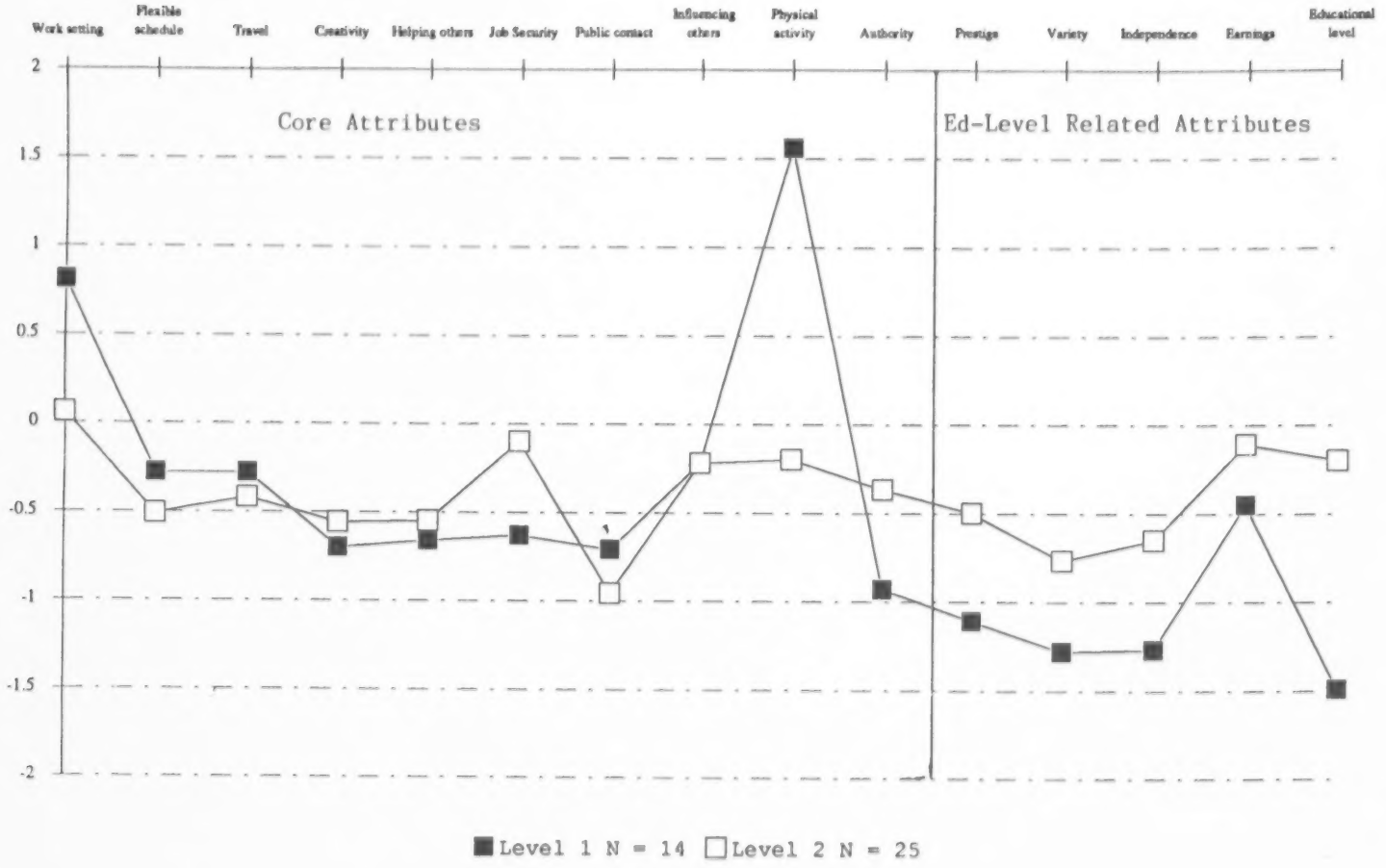


Figure 15. Profile of Recommended DISCOVER attributes for occupations (N > 4) grouped by education level within Job Family M (Engineering and Other Applied Technologies).

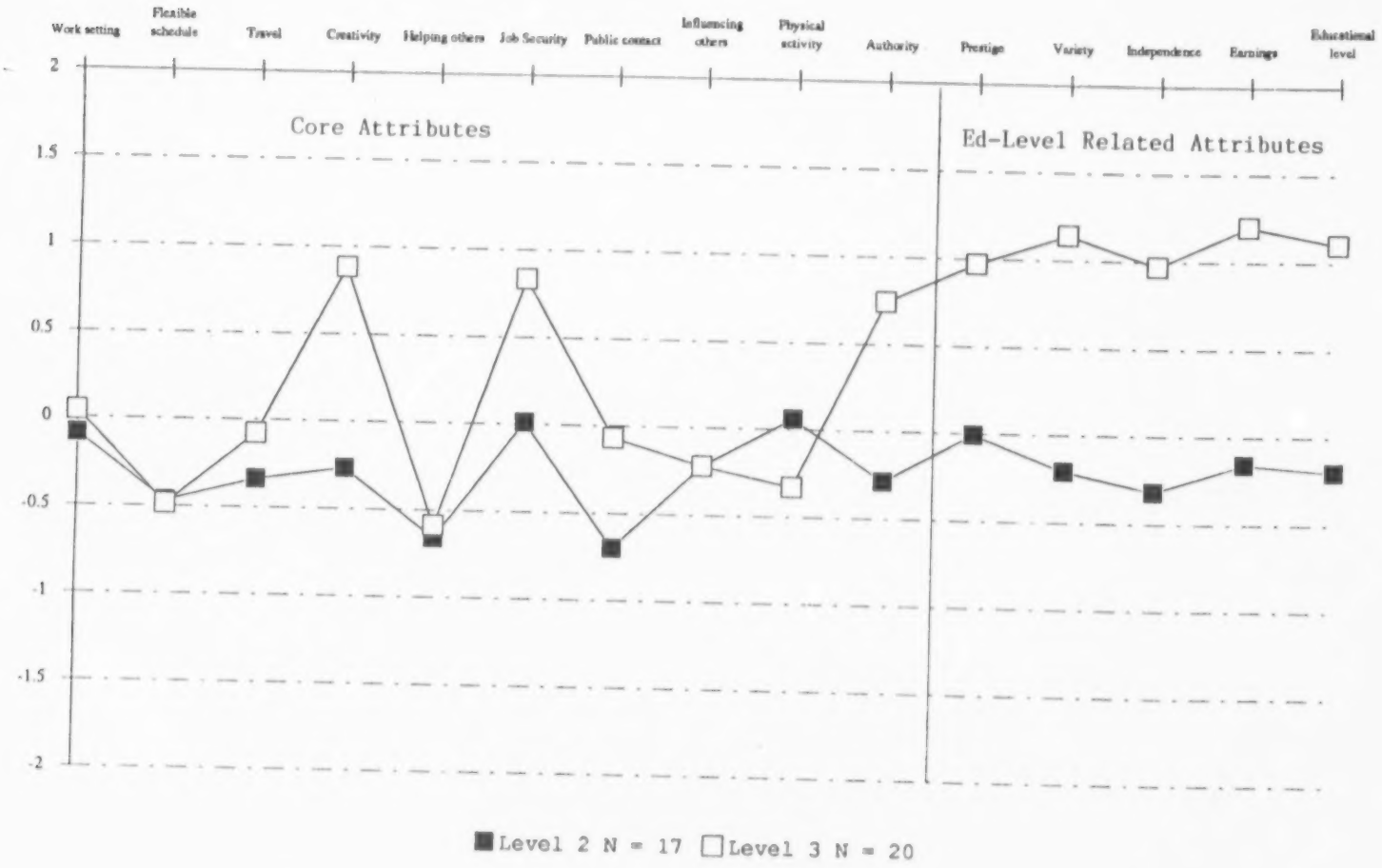


Figure 16. Profile of Recommended DISCOVER attributes for occupations (N > 4) grouped by education level within Job Family N (Medical Specialties and Technologies).

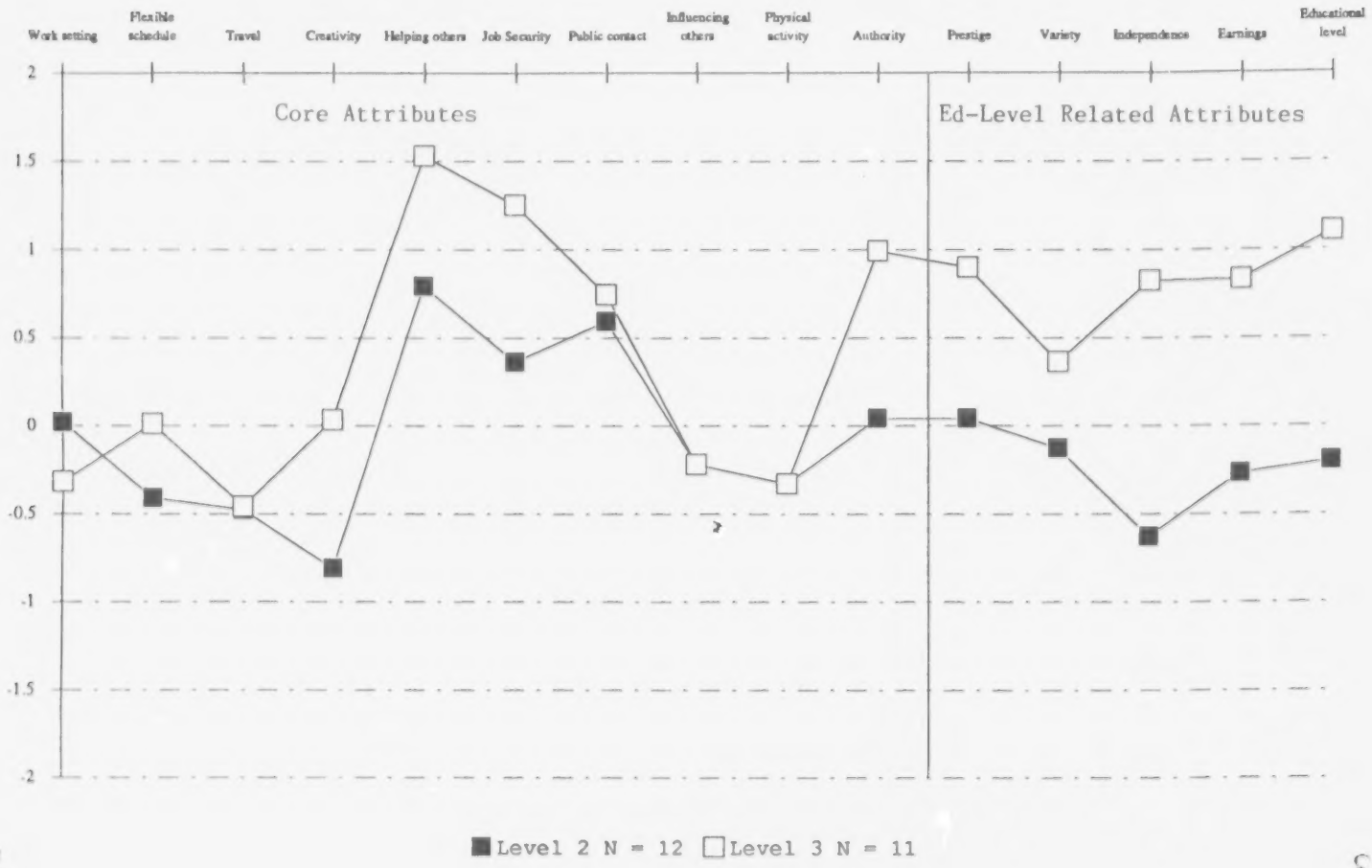


Figure 17. Profile of Recommended DISCOVER attributes for occupations (N > 4) grouped by education level within Job Family T (General Health Care).

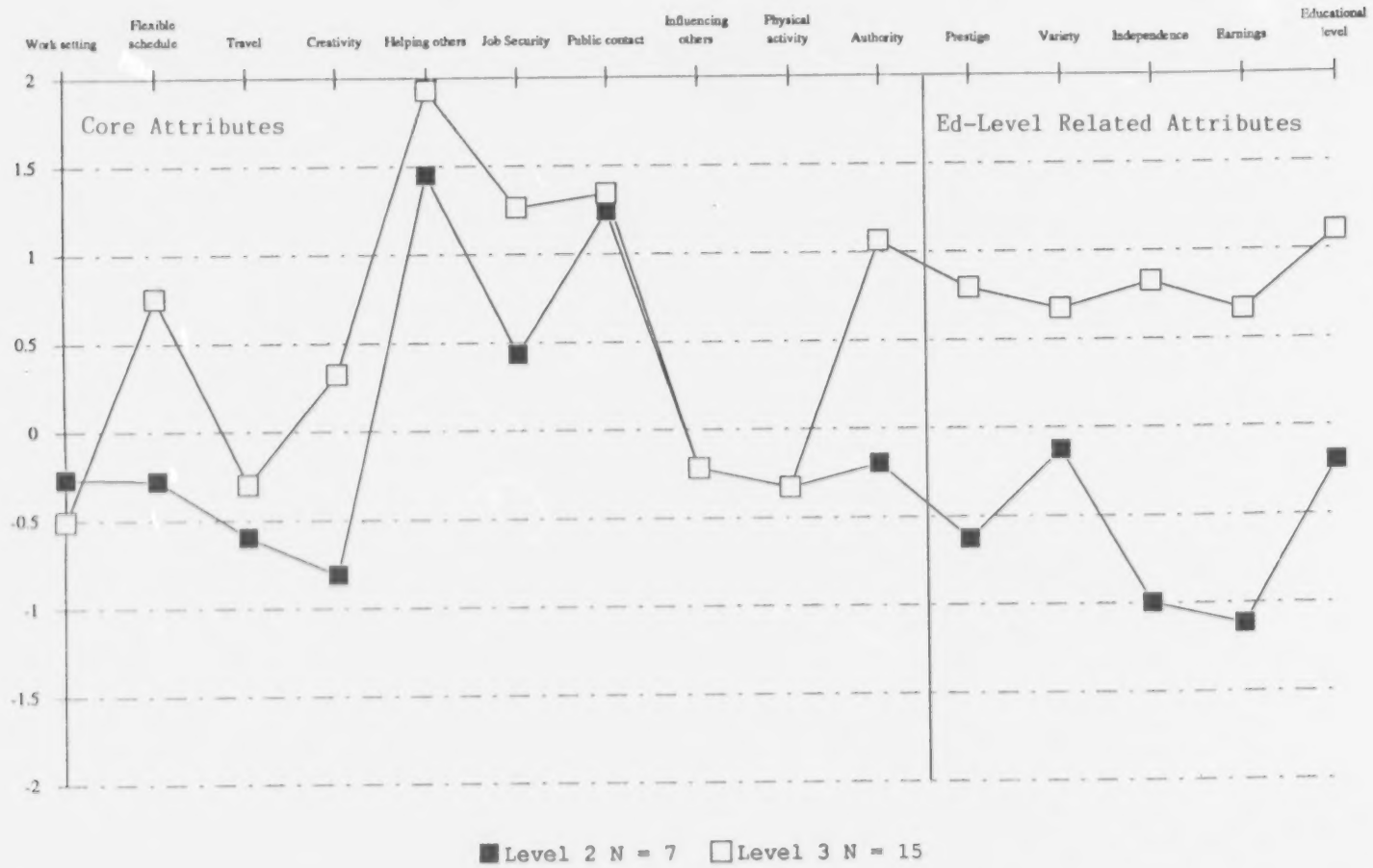


Figure 18. Profile of Recommended DISCOVER attributes for occupations (N > 4) grouped by education level within Job Family V (Social and Government Services).

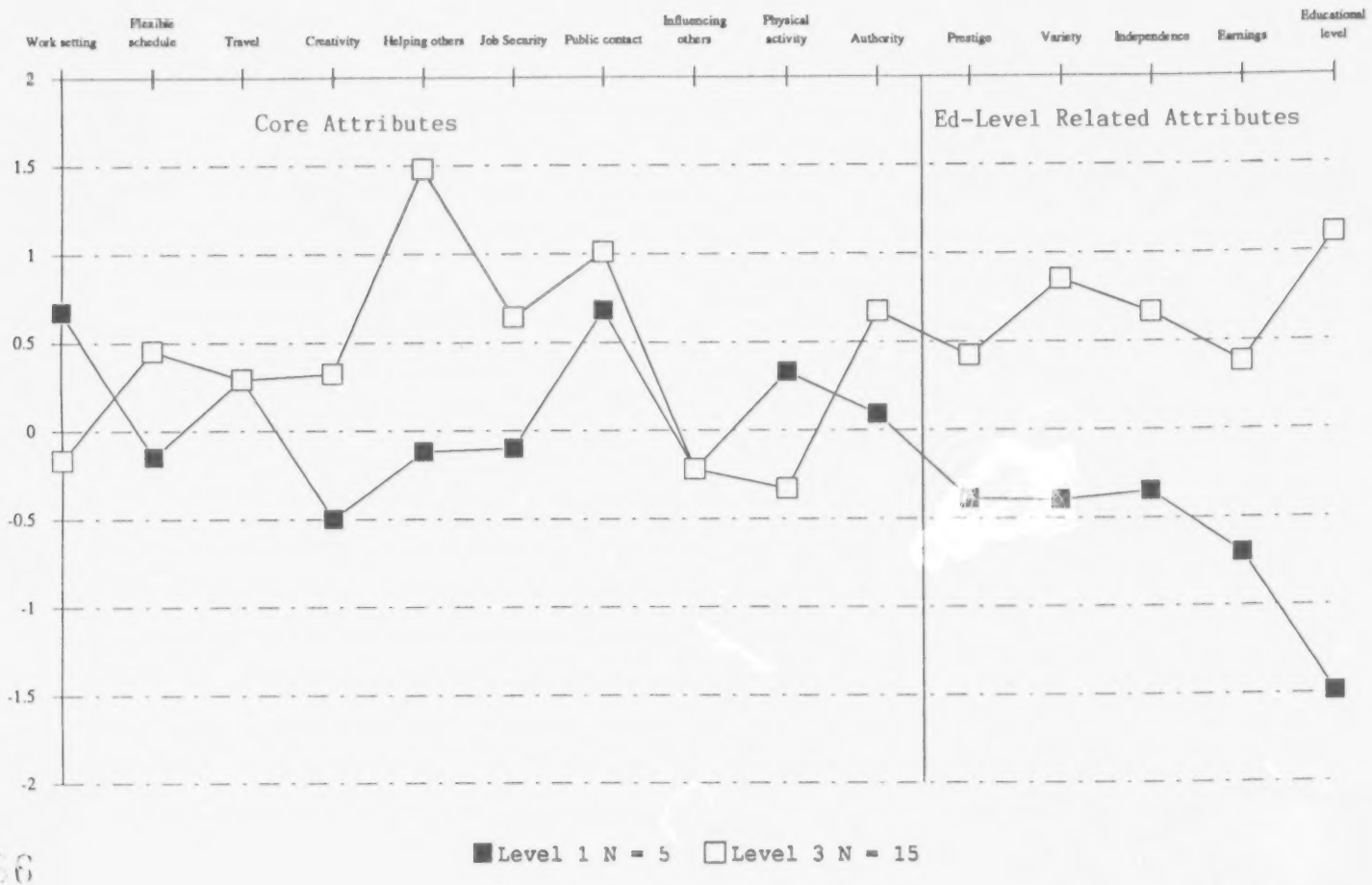
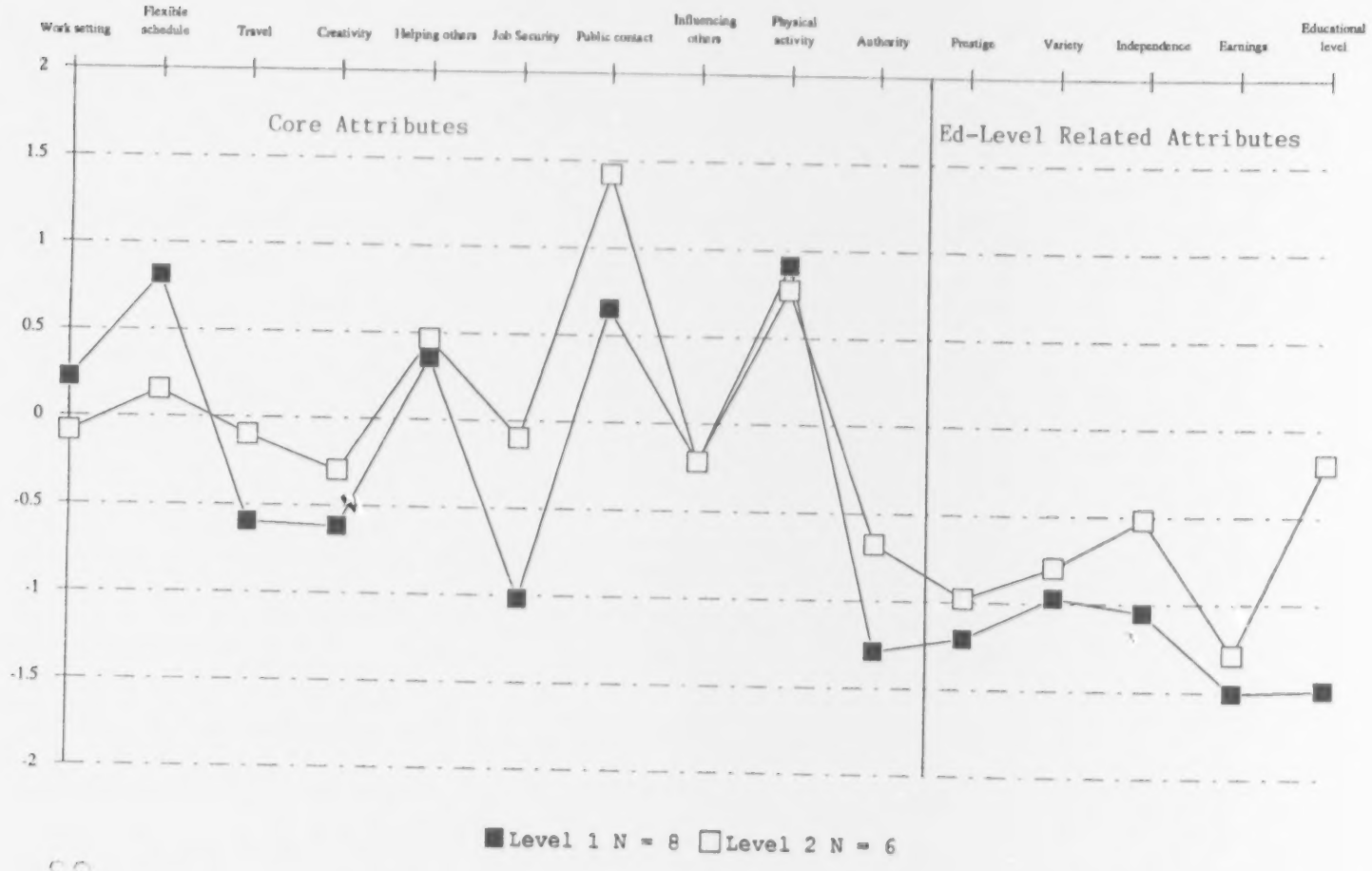


Figure 19. Profile of Recommended DISCOVER attributes for occupations (N > 4) grouped by education level within Job Family W (Personal/Customer Services).



APPENDICES

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Appendix A

Sample Profiles for 36 Occupational Attributes

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Figure A1. Profiles of DISCOVER Job Characteristics for occupations grouped by Holland's types.

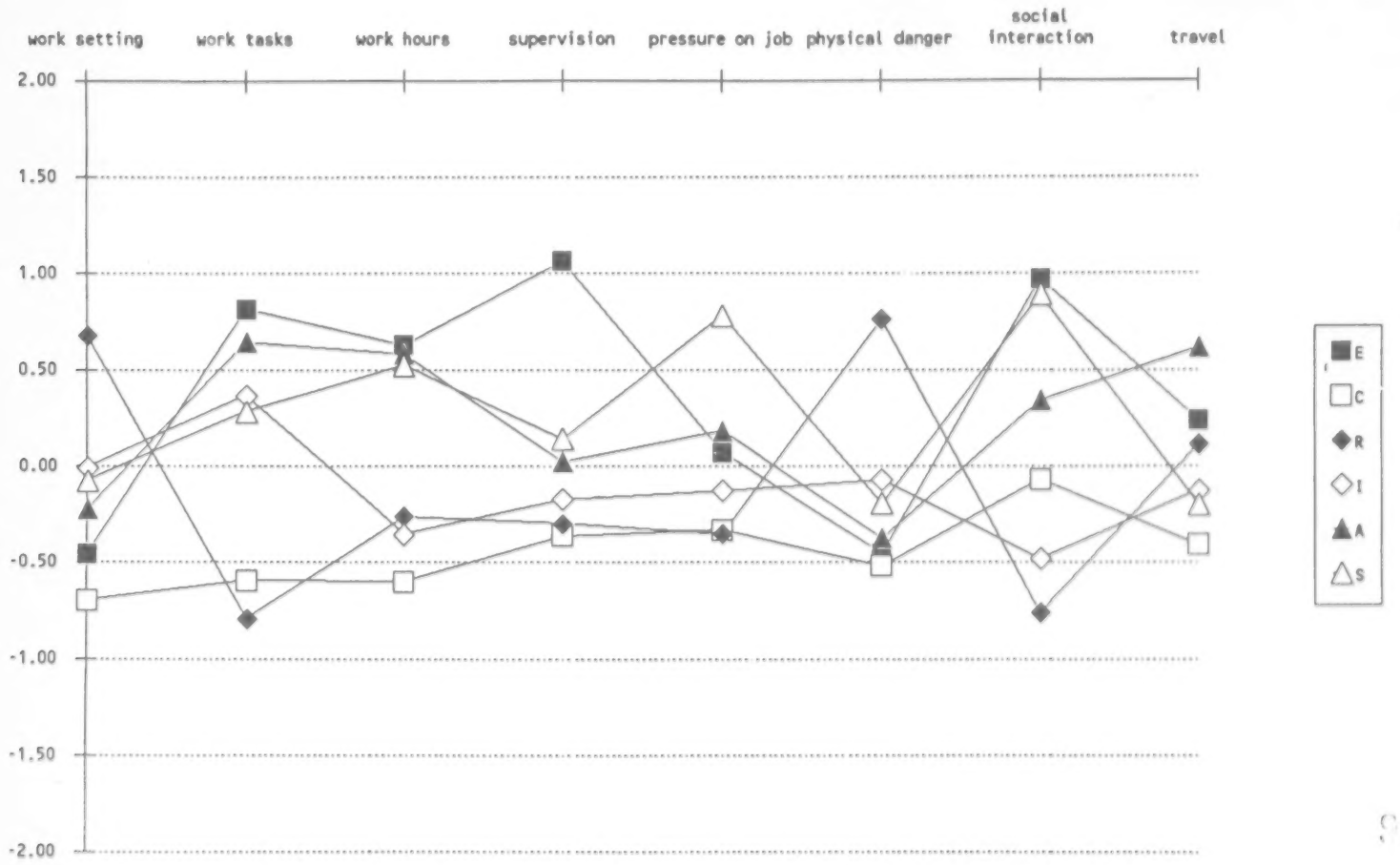


Figure A2. Profiles of DISCOVER Job Values for occupations grouped by Holland's types.

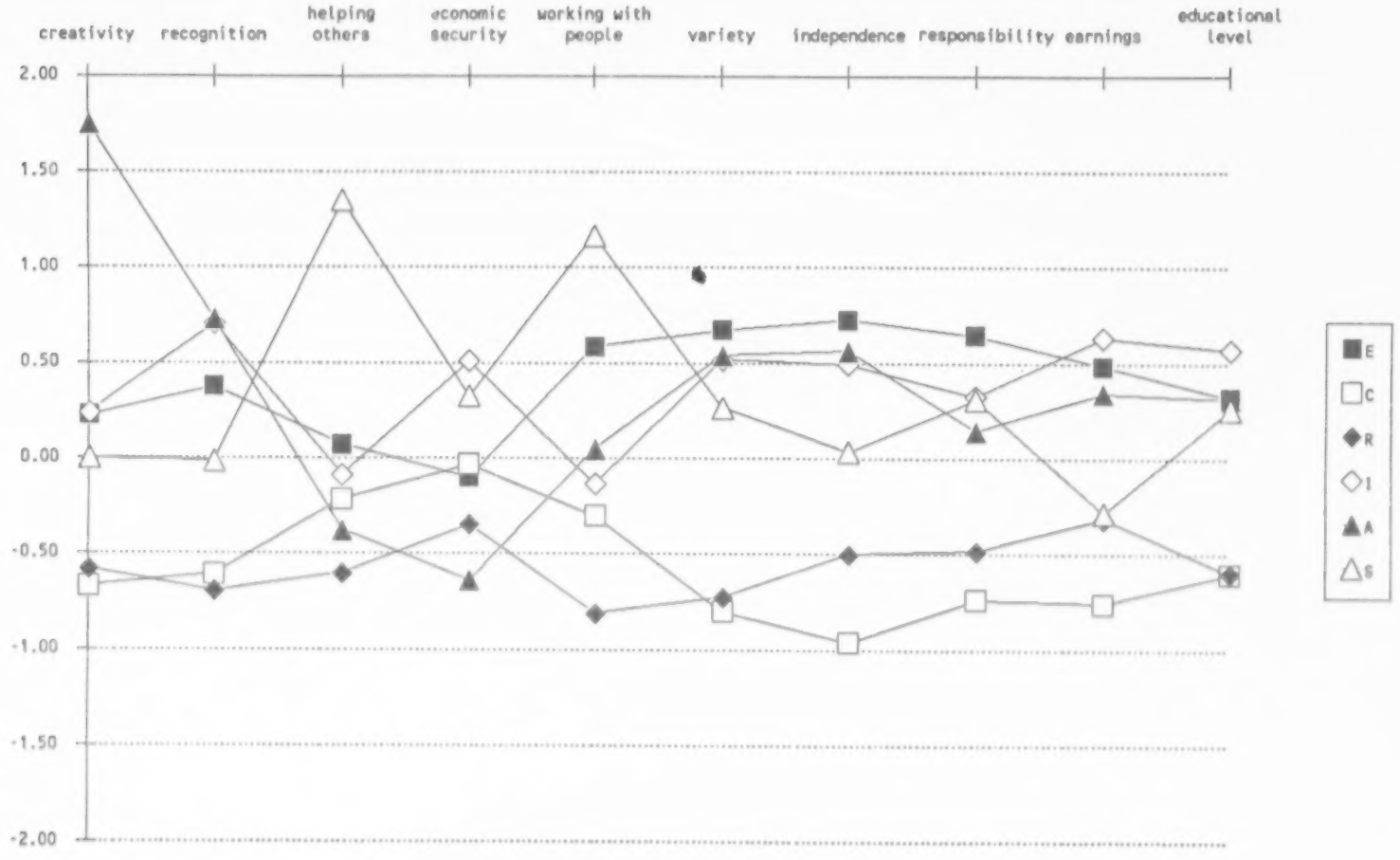


Figure A3. Profiles of GOE Work Values for occupations grouped by Holland's types.

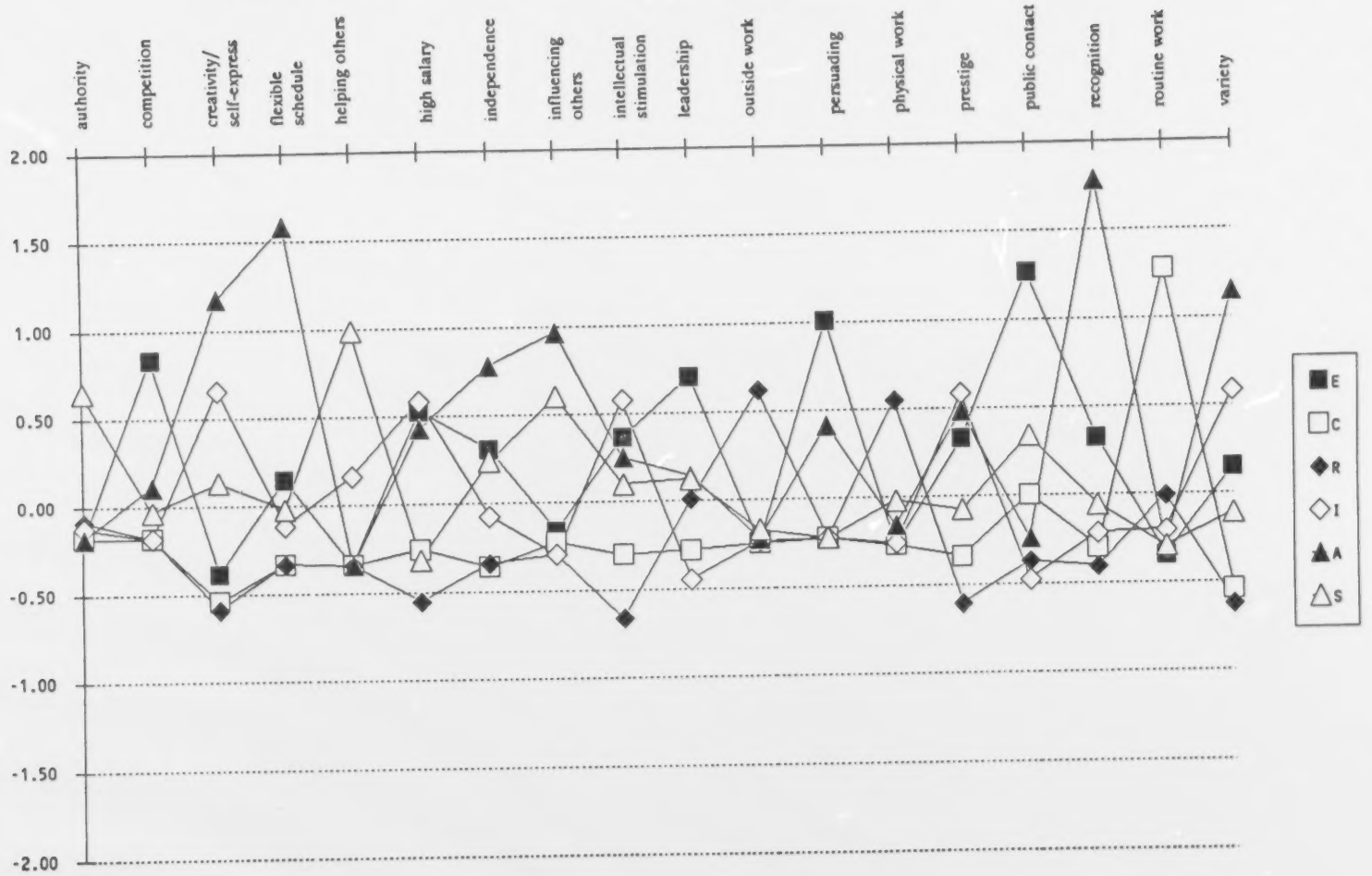


Figure A4. Profiles of DISCOVER Job Characteristics by job family: Enterprising occupations.

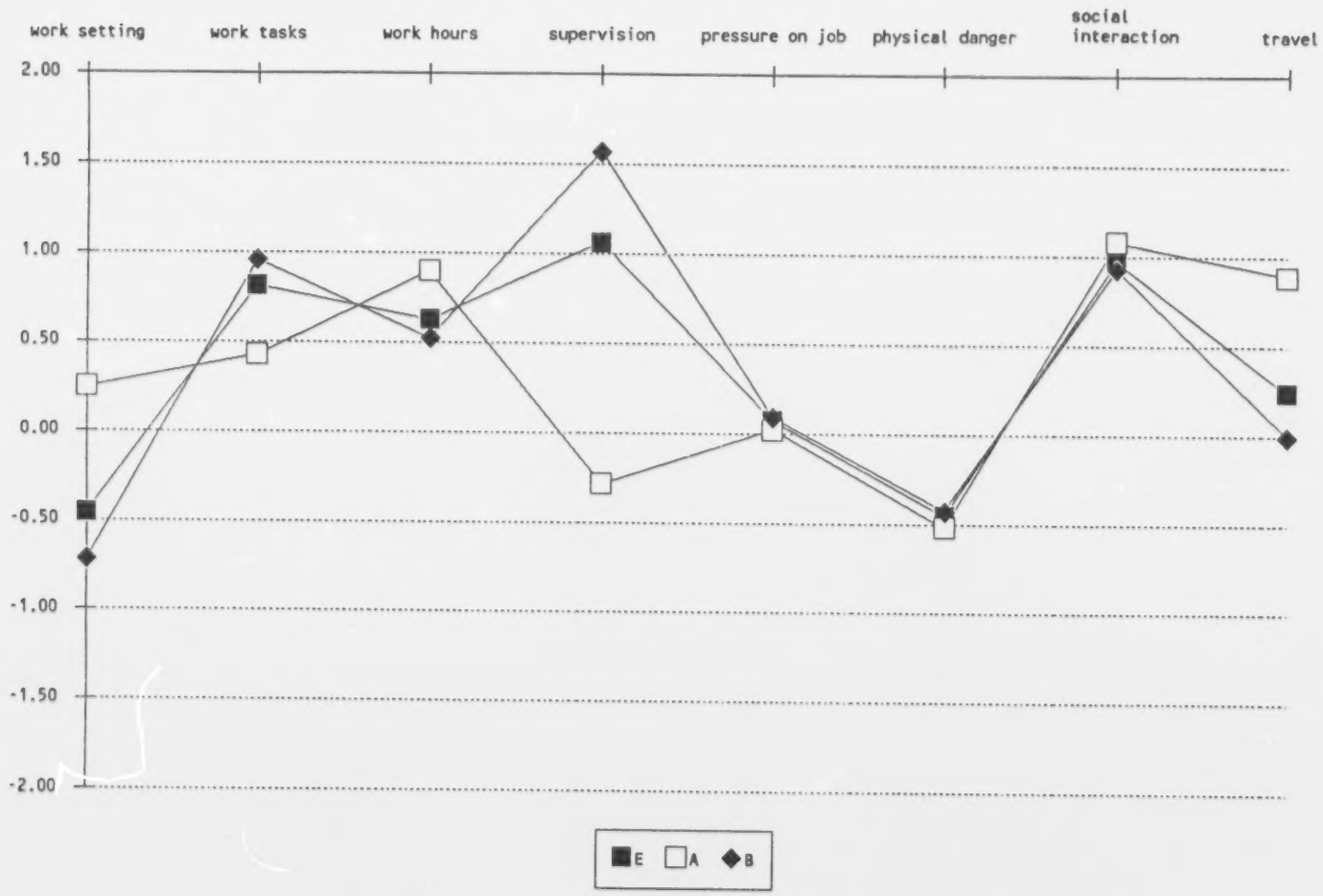


Figure A5. Profiles of DISCOVER Job Values by job family: Enterprising occupations.

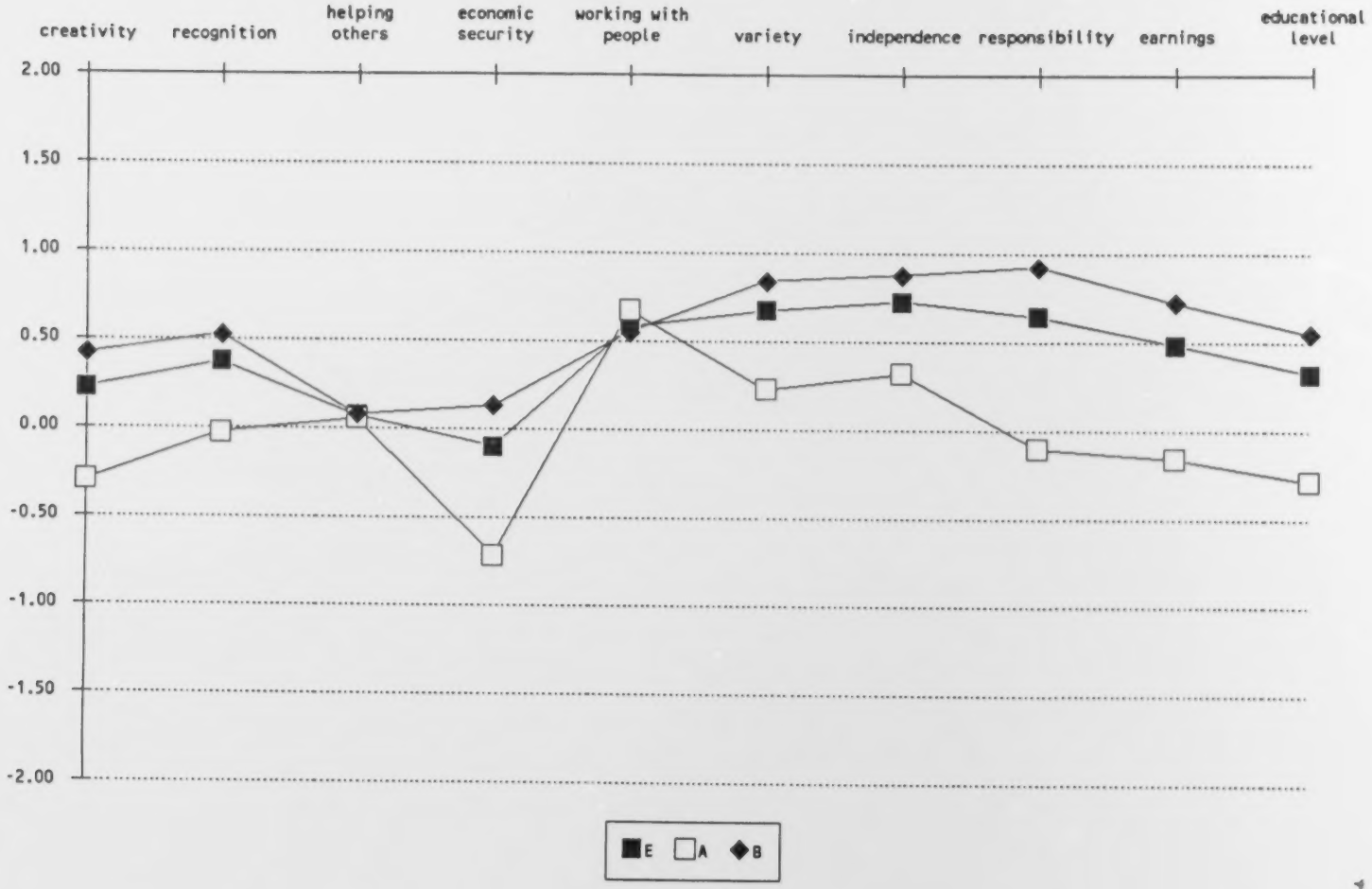
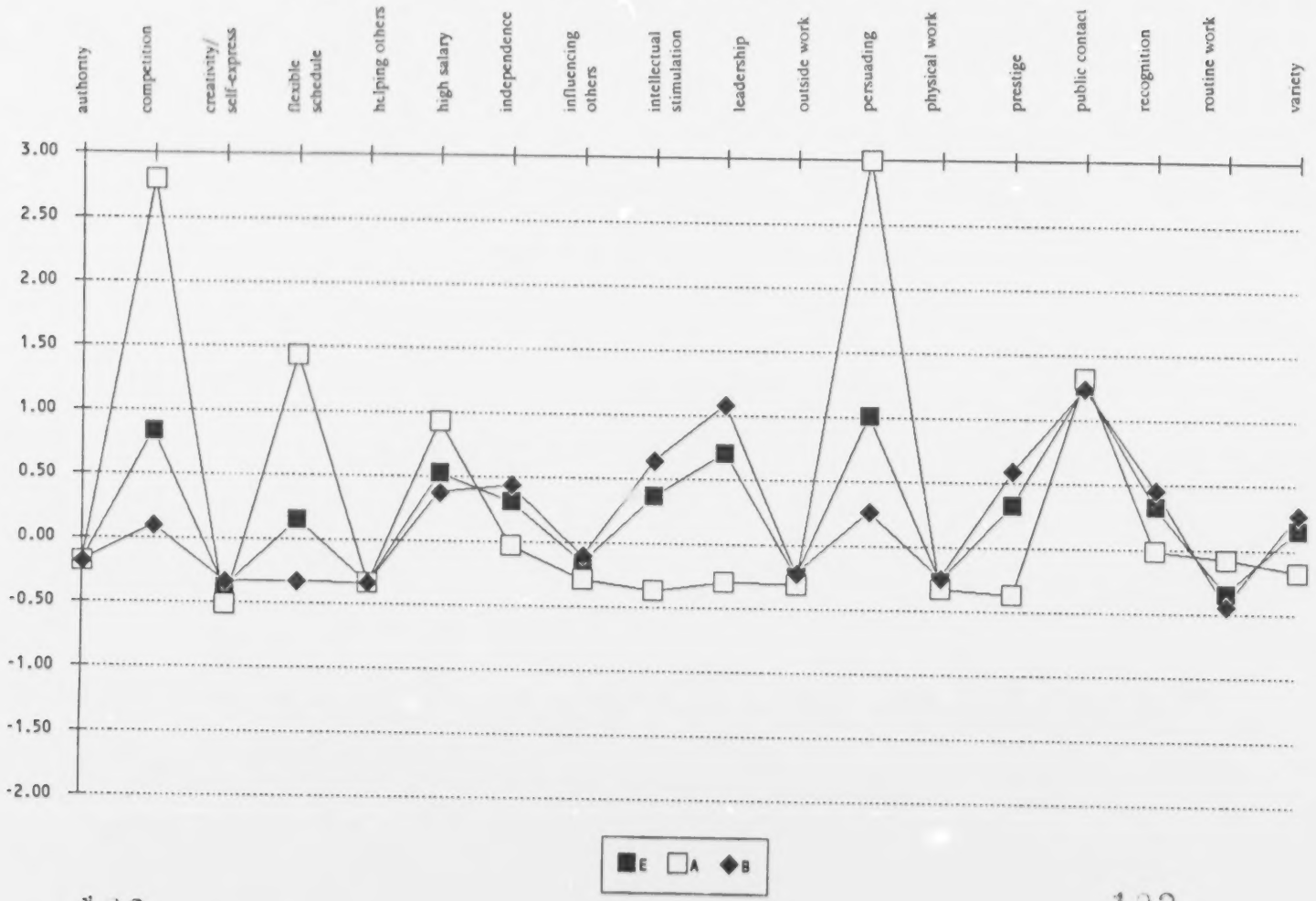


Figure A6. Profiles of GOE Work Values by job family: Enterprising occupations.



Appendix B

Definitions of Occupational Attributes Used in Study Analyses

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B1: DISCOVER Job Values	9
B2: DISCOVER Job Characteristics	13
B3: Guide for Occupational Exploration Work Values	16

Appendix B1

DISCOVER Job Values

Note. Occupations were rated on the basis of the opportunity they provide to attain a given job value (i.e., to experience a given occupational attribute.). Raters used a 5-point scale with each attribute, as explained in the text. A collapsed 3-point scale was used in DISCOVER in order to make the assessment task easier for counselees. The same 3-point scale was used in the analyses described in this report.

The original 5-point rating scale used for eight of the nine attributes was collapsed to a 3-point scale. The rating scale for Creativity, Recognition, Helping Others, Economic Security, and Responsibility was as follows: 3 = better than average to high opportunity, 2 = average opportunity, and 1 = less than average to low opportunity. Three of the DISCOVER job values were considered to be bipolar: Working with People (vs. Working Alone), Variety (vs. Routine), and Independence (vs. Structure). A rating of 3 meant a better than average to high opportunity to experience the attribute anchoring one pole; a rating of 1 had the same meaning for the attribute anchoring the other pole. The final DISCOVER job value, Earnings, was rated on the following scale: 4 = over $45,000/year; 3 = $27,500 to $45,000/year; 2 = $17,500 to $27,500/year; and 1 = below $17,500.

1. Creativity: Creativity in a job means:

   --discovering, designing, or developing new things, and/or
   --being inventive in your job, and/or
   --finding new ways to make or do things

   Creativity is related to innovation, either in product or in procedures. It is not limited to artistic work. Thus, a job involving development of a new manufacturing process would be creative, even though the jobs related to carrying out the process might offer few opportunities for creativity.

2. Recognition: Recognition in a job means:

   --being looked up to because of the work you do, and/or
   --having your work recognized and respected by colleagues, and/or
   --being able to move up in your career because of your knowledge and skills

   Recognition implies being rewarded for doing good work. The reward may take the form of a "better" job (e.g., respect from co-workers, higher salary, more prestigious title, more power and/or responsibility) or of public acknowledgment of the value of one's work (e.g., honors awarded by colleagues). Recognition combines elements of Super's values "advancement" and "prestige."

3. Helping Others: Helping others in a job means:

   --helping people live more satisfying lives, and/or
   --working to make a better society, and/or
   --doing something for others

   Helping others implies that other people are somehow better off as individuals or in the aggregate as a direct purpose of the job. That is, a social work job would be classified as high in this value; a job doing repairs for the power company would not, even though the repair person might be responsible for restoring heat to customers in sub-zero weather.

4. Economic Security: Economic Security in a job means:

--having a job where layoffs are rare, and/or
--working in a field where a qualified worker can usually find a job (Note. DISCOVER jobs all meet, at a minimum level, this last criterion.)

Economic security does not imply, necessarily, a high standard of living; rather, it implies security that basic living needs can be filled. Thus, jobs that have an adequate salary and that are easy to keep and/or easy to acquire (for persons with appropriate qualifications) would be rated high here. Some very well-paid jobs, thus, may not quality.

5. Working With People: Working with people in a job means:

--dealing with the public (such as customers, clients, or patients) frequently, and/or
--regularly performing work tasks together with one or more co-workers, and/or
--routinely sharing information with other workers (such as at meetings)

Some persons enjoy working with people; others, however, prefer working alone. Which do you prefer?

Working with people implies that some sort of face-to-face communication with others occurs on a regular basis. Simply in the presence of others would not be working with people. By the same token, working alone means performing tasks on one's own--not necessarily being out of sight of others while working.

6. Variety: Variety in a job means:

--doing many different tasks, and/or
--having alternative ways to do your job, and/or
--working in varied surroundings

Some people enjoy variety in their work. Others, however, prefer jobs made up of regular, predictable tasks so that the worker can develop a routine for performing them smoothly. Which do you prefer?

Variety implies that one's work responsibilities frequently change in their content and/or setting.

Routine implies stability--job duties that are predictable and unlikely to change abruptly or frequently.

7. Independence: Independence in a job means:

   --working without supervision, and/or
   --working at your own pace, and/or
   --choosing your own work hours

   Some people enjoy independence in their work. Others, however, are more comfortable in a job that provides structure--that has regular work hours and specific rules for the kind and amount of work to be done. Which do you prefer?

   Independence equates with Super's "Autonomy." Note that Independence doesn't mean a total lack of restraint. A farmer, for instance, would be rated high on Independence even though climate and geography limit his (or her) choices of crops, planting times, etc. Independence, thus, implies freedom from a structure created by other persons.

8. Responsibility: Responsibility in a job means:

   --taking charge of deciding what work should be done, and/or
   --planning the work for yourself and/or others, and/or
   --being accountable for the success of work that you are involved in

   Some people enjoy responsibility in their work. Others, however, prefer jobs with little responsibility, so that someone else takes on the tasks of planning, deciding, etc. Which do you prefer?

   Responsibility can be either responsibility for one's own work or responsibility for directing and supervising work of others. In the latter case, some elements of Super's "Authority" would be present.

9. Earnings: Jobs differ considerably in the amount of money earned by the typical person who is well-established in his or her career. When assigning ratings, assume a full-time, year-round, experienced worker who has not had his/her career interrupted (for instance, by extended "time-out" for child-rearing).

Appendix B2

DISCOVER Job Characteristics

Note. The scale used in rating an occupation is shown separately for each job characteristic.

1. Work Setting
   1 - Indoors, in an office
   2 - Indoors, other than office
   3 - Indoors and outdoors
   4 - Outdoors

2. Work Tasks
   1 - Routine tasks (low variety)
   2 - Different tasks (high variety)

3. Work Hours
   1 - Regular 7 - 8 hour day
   2 - Irregular (taking work home)

4. Supervision
   1 - No planning or supervision of work of others
   2 - Plan work for and supervise others

5. Pressure on the Job
   1 - Neither 2 nor 3
   2 - Pressure due to time
   3 - Pressure due to responsibility for physical/emotional well-being of others
   4 - Both 2 and 3

6. Physical Danger
   1 - Little or no risk of physical danger
   2 - Some risk of physical danger
   3 - High risk of physical danger

7. Social Interaction
   1 - Tasks involve working with things, tools
   2 - Tasks involve working closely with people

8. Travel
   1 - Little or no travel required
   2 - Much local travel
   3 - Much long-distance travel

9. Education Entry Level
   1 - High school graduation desirable or required
   2 - Some education beyond high school (technical school, military training, or associate degree) desirable or required
   3 - Bachelor's degree and/or Graduate degree desirable or required

Appendix B3

Guide for Occupational Exploration Work Values

Note: The 18 Guide for Occupational Exploration (Harrington & O'Shea, 1984) work values used in study analyses have an asterisk (*) next to their title.

1. **Adventure:** Working in a job that requires taking risks.

2. ***Authority:** Working in a job in which you use your position to control others.

3. ***Competition:** Working in a job in which you compete with others.

4. ***Creativity and self-expression:** Working in a job in which you use your imagination to find new ways to do or say something.

5. ***Flexible work schedule:** Working in a job in which you choose your hours of work.

6. ***Helping others:** Working in a job in which you provide direct services to persons with problems.

7. ***High salary:** Working in a job where many workers earn a large amount of money.

8. ***Independence:** Working in a job in which you decide for yourself what work to do and how to do it.

9. ***Influencing others:** Working in a job in which you influence the opinions or decisions of others.

10. ***Intellectual stimulation:** Working in a job which requires a considerable amount of thought and reasoning.

11. ***Leadership:** Working in a job in which you direct, manage, or supervise the activities of others.

12. ***Outside work:** Working out-of-doors.

13. ***Persuading:** Working in a job in which you personally convince others to take certain actions.

14. ***Physical work:** Working in a job which requires substantial physical activity.

15. ***Prestige:** Working in a job which gives you status and respect in the community.

16. **Public attention:** Working in a job in which you attract immediate notice because of appearance or activity.

17. ***Public contact:** Working in a job in which you have day-to-day dealings with the public.

18. ***Recognition:** Working in a job in which you gain public notice.

19. **Research work:** Working in a job in which you search for and discover new facts and develop ways to apply them.

20. ***Routine work:** Working in a job in which you follow established procedures requiring little change.

21. **Seasonal work:** Working in a job in which you are employed only at certain times of the year.

22. **Travel:** Working in a j in which you take frequent trips.

23. ***Variety:** Working in a job in which your duties change frequently.

24. **Work with children:** Working in a job in which y teach or otherwise care for children.

25. **Work with hands:** Worki in a job in which you use y hands or hand tools.

26. **Work with machines or equipment:** Working in a jo in which you use machines o equipment.

27. **Work with numbers:** Working in a job in which y use mathematics or statisti

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Appendix C

Definitions for Recommended Attributes

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[a]Rating scale is defined as follows: Rarely (the opportunity for the typical worker to experience the attribute is less than weekly, as a rule); Occasionally (more than weekly but less than daily, as a rule); Frequently (on a daily basis, as a rule).

Public Contact in a job means:

- "real-time," two-way, oral communication (whether face-to-face or electronic) with the public (customers, clients, patients, students, etc.).

Public Contact does not include contact with co-workers.

Rating Scale

For the occupation to be rated, indicate (on a scale of 1 to 3) the frequency with which a typical worker would have an opportunity to experience this attribute.

1	2	3
Rarely	Occasionally	Frequently
1: Furnace Operator	2: General Office Clerk	3: Flight Attendant
1: Drafter	2: Automotive Mechanic	3: Security Guard

Rater's Clarifying Notes:

Influencing Others in a job means:

- having an effect on the opinions, decisions, or actions of individuals or groups.

Influencing Others often involves sales or public contact, but also may be limited to co-workers. Influencing others can occur through verbal, written, or visual presentations, whether transmitted face-to-face or electronically. The influence is exerted by persuasion, example, etc. rather than by authority.

Rating Scale

For the occupation to be rated, indicate (on a scale of 1 to 3) the frequency with which a typical worker would have an opportunity to experience this attribute.

	2	3
Rarely	Occasionally	Frequently
1: Drycleaner	2: Buyer	3: Manufacturer's Representative
1: Bank Teller	2: College Professor	3: Public Relations Specialist

Rater's Clarifying Notes:

Authority in a job means:

- planning and/or directing the work of others or a project others will complete.
- assigning people to work tasks and seeing that the tasks are accomplished in compliance with plans and standards.

Authority implies responsibility, but responsibility does not necessarily imply authority. Refers to authority over workers, not authority over the general public.

Rating Scale

For the occupation to be rated, indicate (on a scale of 1 to 3) the frequency with which a typical worker would have an opportunity to experience this attribute.

1	2	3
Rarely	Occasionally	Frequently
1: Tool and Die Maker	2: Systems Analyst	3: Restaurant Manager
1: Data Entry Keyer	2: Dietician	3: Educational Administrator

Rater's Clarifying Notes:

Helping Others in a job means:

- Improving the lives of others by activities such as advising, mentoring, informing, physically assisting, healing, etc.
- helping others directly (person-to-person).

Helping Others implies that other people (as individuals or in the aggregate) are better off as a direct purpose of the job. For example, a social work job would be classified as high in this value. A job doing repairs for the power company would not, even though the repair person might be responsible for restoring heat to customers in sub-zero weather.

Rating Scale

For the occupation to be rated, indicate (on a scale of 1 to 3) the frequency with which a typical worker would have an opportunity to experience this attribute.

1	2	3
Rarely	Occasionally	Frequently
1: Welder	2: Pharmacist	3: Counselor
1: Pest Controller	2: Police Officer	3: Dentist

Rater's Clarifying Notes:

Flexible Schedule in a job means:

- deciding when the work day begins or ends (including whether or not to work longer than the typical work day), and/or
- deciding where work will be done during a given work day (e.g., part of day at home; rest of day at place of business).

A Flexible Schedule may affect when leisure time is available and the amount of leisure time. Full-time rather than part-time employment should be considered.

Rating Scale

For the occupation to be rated, indicate (on a scale of 1 to 3) the frequency with which a typical worker would have an opportunity to experience this attribute.

1	2	3
Rarely	Occasionally	Frequently
1:	2:	3:
1:	2:	3:

Rater's Clarifying Notes:

Anchor occupations not yet developed.

Creativity in a job means:

- being inventive in one's job; e.g., designing things or finding new ways to make or do things, and/or
- finding new ways of expressing something, e.g., with words, paint, equations, or music.

Creativity can involve innovation in products (e.g., a widget), procedures (e.g., a method of inventory control), or concepts (e.g., an ad campaign). Creativity includes, but is not limited to, artistic expression (e.g., painting, musical performance, etc.).

Rating Scale

For the occupation to be rated, indicate (on a scale of 1 to 3) the frequency with which a typical worker would have an opportunity to experience this attribute.

1	2	3
Rarely	Occasionally	Frequently
1: Pipefitter	2: Radio/TV Announcer	3: Fashion Designer
1: Air Traffic Controller	2: Upholsterer	3: Biomedical Engineer

Rater's Clarifying Notes:

Travel in a job means:

- travel must be an essential part of the job.

Travel distance can vary from within a community, across communities, to distant nations. Overnight travel is defined as travel involving one or more nights away from home. In contrast, day travel does not require nights away from home.

Rating Scale

For the occupation to be rated, indicate (on a scale of 1 to 3) the category that best describes the type/amount of travel done by the typical worker.

1	2	3
Little or no travel is required	Large amount of day travel is required	Large amount of overnight travel is required
1: Optometrist	2: Real Estate Agent	3: Truck Driver
1: Shoe Repairer	2: Office Machine Servicer	3: Pilot
1: Actuary	2: Taxi Driver	3: Sales Representative

Rater's Clarifying Notes:

Work Setting in a job means:

- where work tasks are primarily performed.

Rating Scale

For the occupation to be rated, indicate the category that best describes the work location of the typical worker.

1	2	3	4
Indoors, in an office	Indoors, not in an office	Combination of indoors and outdoors	Outdoors
1: Legal Secretary	2: Appliance Repairer	3: Airplane Mechanic	4: Mail Carrier
1: Purchasing Agent	2: Pilot	3: Locksmith	4: Logger

Rater's Clarifying Notes:

Physical Activity in a job means:

- work that requires the movement of work supplies, tools, controls, materials, products, etc. through use of physical strength.

Physical Activity is not only related to the weight and shape of what is moved, but also to the mode of moving (e.g., lifting, carrying, pushing, pulling) and the frequency, distance, elevation, etc. of movement.

Rating Scale

For the occupation to be rated, choose the response that best describes the lifting/carrying requirements of the typical worker.

1	2	3
Minimal lifting, carrying, etc. DOL: Sedentary Work	Lifting (up to 20 lbs) and/or frequent carrying (up to 10 lbs) DOL: Light Work	Lifting 20 lbs or more and/or frequent carrying of 10 lbs or more DOL: Medium or Heavier Work
1:	2:	3:
1:	2:	3:

Rater's Clarifying Notes:

Ratings for most (if not all) occupations will be obtained from Department of Labor (DOL) files. DOL strength ratings associated with each category (p. 1013 of 1991 revised 4th edition DOT) are shown.

Anchor occupations not yet developed.

Job Security in a job means:

- employed in a field where workers are more likely than in other occupations to retain their jobs during recessions, government budget cuts, or when new technologies are introduced.

Rating Scale

For the occupation to be rated, indicate (on a scale of 1 to 3) the chances of retaining the job despite recession, government budget cuts, or the introduction of new technology.

1	2	3
Below average	About average for jobs in general	Above average
1	2	3
1	2	3

Rater's Clarifying Notes:

When available, base this judgment on job security information provided by the Occupational Outlook Handbook (OOH; 1990) job description (see OOH bottom of p. 2).

Anchor occupations not yet developed.

Job Opportunities in a job means:

- how easy or hard it is to find work in a given occupation.

Job Opportunities refers to the competition an applicant will face when seeking a job. Unless the OOH specifically mentions competition, each of the following factors (when available) must be weighed: growth rate, size of occupation, turnover rate, unemployment rate, training/investment required, salaries and working conditions, changing technologies, and economic factors. For example, slow-growing occupations with a high turnover rate may offer excellent employment prospects. The desirability of the job must not be considered when coding this factor.

Rating Scale

For the occupation to be rated, indicate (on a scale of 1 to 3) the level of difficulty people experience in finding work.

1	2	3
Harder than average	Average	Easier than average
1: Telephone Operator	2: Market Research Analyst	3: Surgical Technologist
1: Commercial Artist	2: Farm Equipment Mechanic	3: Correctional Officer

Rater's Clarifying Notes:

Look for the following statements in the OOH:

3. Easier than average: "very good" or "excellent" job opportunities; "replacement needs will be substantial;" "rapid employment growth" (without but's); "favorable;" "increasing much faster than average."

2. Average: "good" opportunities; "most openings will arise from the need to replace;" "moderate demand."

1. Harder than average: "keen competition;" "competitive;" "declining;" "growing slower than average."

Prestige in a job means:

- the social status resulting from the type of work one does.

Prestige is not dependent on work performance, but rather on the occupation's status among other occupations, as perceived by the general public.

Rating Scale

For the occupation to be rated, indicate (on a scale of 1 to 4) the standing of this occupation among occupations in general.

1	2	3	4
Lowest third	Middle third	Upper third (excluding top 10%)	Top 10%
1:	2:	3:	4:
1:	2:	3:	4:

Rater's Clarifying Notes:

Ratings for most (if not all) occupations will be based on published, empirical research.

Anchor occupations not yet developed.

Earnings in a job means:

- amount of money earned per year by the typical person who is moderately well-established (3-5 years) in his/her career.

Earnings ratings should assume a full-time, experienced worker who has not had his/her career interrupted.

Rating Scale

For the occupation to be rated, indicate the category that best describes a typical worker who is well-established in his/her career.

1	2	3	4
Lowest third (Less than $aa,aaa per year)	Middle third ($aa,aaa - $bb,bbb)	Top third (more than $bb,bbb)	Top 10% (More than $cc,ccc per year)
1:	2:	3:	4:
1:	2:	3:	4:

Rater's Clarifying Notes:

Dollar cut-offs and ratings to be determined from U.S. Department of Labor data.

Independence in a job means:

- working at one's own pace, and deciding how the work is to be done and what to do first, second, etc..
- not having a supervisor tell you how to do your work.

Independence implies personal control over work tasks and task priorities. It does not mean a complete lack of constraints--rather, flexibility within the constraints of required work hours, objectives, quality standards, etc. The opposite of independence is structure--specific rules for the kind, sequence, and amount/quality of work.

Rating Scale

For the occupation to be rated, indicate (on a scale of 1 to 3) the frequency with which a typical worker would have an opportunity to experience this attribute.

1	2	3
Rarely	Occasionally	Frequently
1: Billing Clerk	2: Barber	3: Forester
1: Roofer	2: Truck Driver	3: Sociologist

Rater's Clarifying Notes:

Variety in a job means:

- having tasks that change and that require the use of different skills (e.g., numerical and social; mechanical and artistic).

Variety implies that one's work tasks change in content and skill requirement. Routine, the opposite of variety, implies job duties that are similar and predictable from day-to-day.

Rating Scale

For the occupation to be rated, indicate (on a scale of 1 to 3) the frequency with which a typical worker would have an opportunity to experience this attribute.

1	2	3
Rarely	Occasionally	Frequently
1: Typist	2: Insurance Agent	3: Veterinarian
1: Usher	2: Surveyor	3: Geologist

Rater's Clarifying Notes:

Education Level in a job means:

- The level of education required to attain entry into a job.

The Education Level 5-point rating scale currently used in DISCOVER is shown below.

Rating Scale

For the occupation to be rated, indicate the level of education required to attain entry.

1	2	3	4	5
Completion of high school or less	Some education after high school (< 2 yrs)	Two years of college (community/junior)	A four year college degree	Graduate work after college
1:	2:	3:	4:	5:
1:	2:	3:	4:	5:

Rater's Clarifying Notes:

Currently, every occupation in DISCOVER is assigned one or more levels. Category number 2 includes apprenticeship programs, vocational/technical training, and military job training.

Anchor occupations not yet developed.